ESTABLISHED IN 1872

PAPER TRADE JOURNAL

With Which Is Combined

PAPER

Vol. XCIII, No. 7 Thursday, August 13, 1931

Huge Power Project Proposed for Manitoba

Chicago Financial Interests Reported to be Negotiating With Government Regarding Plans for Investment of $30,000,000 In Water Power Development—Pulp and Paper Mills May Be Established and Railroad Built From Gypsumville to Grand Rapids, Thence to Hudson Bay Railway—Officials Declare Time Not Yet Ripe for Statement

Huge Power Development Planned

A despatch from Winnipeg states that powerful financial interests in Chicago are in negotiation with the Government of Manitoba in regard to plans for an investment of $30,000,000 in water power development, in establishing pulp and paper mills, and in building a railway from Gypsumville to Grand Rapids, and thence to the Hudson Bay Railway.

The proposed plan would involve the development of a huge power project either on the Dauphin River or at Grand Rapids, construction of pulp and paper mills in the inter-lake area north of Gypsumville, and the building of a direct rail line linking Winnipeg with Churchill. The proposed railway would tap the Hudson Bay Railway north of Grand Rapids, at the northwest end of Lake Winnipeg.

Thomas J. McManus, representative of important Chicago moneyed interests, who has been conferring with Premier John Bracken, and the Hon. Donald G. McKenzie, Minister of Mines and Natural Resources, stated in a press interview that nothing definite had been settled. He said he would return to Chicago to make a report on his findings and "then perhaps there may be developments."

Both Premier Bracken and Mr. McKenzie declared the time was not ripe for any statement on the proposition. They added, however, they were eager to further anything that would increase employment to Manitoba citizens and thus advance the welfare of Winnipeg and the province as a whole.

Reduction in Stumpage Rates

Both the Quebec and the New Brunswick governments have announced substantial reductions in stumpage rates in order to encourage lumbering operations in the woods this winter. In Quebec the charge on sawn lumber is cut as much as 25 per cent in some cases. The stumpage on pulpwood is cut from $2.70 to $2.50 per M. feet.

It is expected that the companies will increase their cutting programs by an additional 200,000,000 board feet, giving employment to approximately 5,000 additional men. Reduction agreed upon applies to all wood cut, not only to the additional 200,000,000 feet.

For the pulp and paper companies the reduction from $2.70 to $2.50 per M. feet means a saving of from $1.20 to $1.25 per cord. On sawn lumber for the white pine group the rate of $3 per M. board feet is cut to $2.50; on the red pine and hardwood group from $2.50 to $2.00; on spruce, balsam, cedar, jackpine and poplar group, the rate is reduced from $2 to $1.50. In the matter of employment it means that 20,000 men will work in the shanties, an increase of approximately 5,000 because of the extra cut, who will earn $3,500,000 in wages. In addition there is the wage bill for the drivers and men employed in the mill work.

Some idea of the importance of the agreement entered into between the Government and the companies may be had by knowledge of the following facts: During the year ended June 30, 1929, the cut amounted to 1,252,580,000 board feet; for the year ended June 30, 1930, the cut amounted to 1,300,000,000 board feet; for the year ended June 30, 1931, the cut fell to 842,347,115 board feet.

At a recent conference the companies informed the Government that the program for next winter's cut amounted to 540,000,000 board feet. It will be thus seen that even if the 200,000,000 additional cut which the Government has induced the companies to undertake, the cut next winter will be even less than that of last year.

In New Brunswick the stumpage rate is reduced by one-third. In this case the reduction is to be put into effect provided that assurance is received from the Federal Government of satisfactory assistance in bearing the loss of revenue which is thereby occasioned to the Provincial Treasury. Last year the government was able to apply the deficit incurred by the reduction to a portion of unemployment relief money secured from the Federal authorities. That portion was 15 per cent of whatever loss resulted to the Provincial Government's revenue as a result of the lower rates of stumpage being collected under this new order.

Paper Plant for Fernie, B. C.

From Fernie, B. C., it is announced that a company known as Flat Head Paper Mills has been incorporated in British Columbia as a million dollar concern to enter the production of pulp and paper and general lumber operations at Fernie. The authorized capital of $1,000,000 is divided into 10,000 shares of $100 par value each and in addition, 40,000 shares of no par value.

Chicago Paper Trade Anticipates Busy Autumn

Inquiries for Future Requirements Are Fairly Numerous and Purchasing Should Expand Materially in Near Future, as Stocks in Hands of Dealers Are Reported Low—Current Demand for Paper Rather Restricted, Due to Usual Seasonal Causes

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., August 10, 1931—Plenty of heat, vacations and slackening of demand has made the past week one of the slowest from a retail standpoint in the Chicago area. There is a definite feeling, however, among the manufacturers representatives, jobbers, etc., that the prospects for Fall are fairly bright. Despite summer dullness a great deal of talk has been going on, inquiries are plentiful and the very low stocks of dealers at least show quite a bit of promise for buying in the near future.

As far as changes in the various papers themselves are concerned there has been little or no activity. News print is unchanged, according to reports, and 55 to 60 per cent capacity is reported. Improvement in Fall business is expected to help this market out considerably. In the fine paper grades a definite slowness has set in but numerous inquiries seem to point to a definite improvement in the Fall. No further price disarrangements are reported and a return to some sort of stability will help this market. Book and cover papers remain about the same. Ground woods are dull. The board market is going forward on a very slow basis but, with many months spent on curtailment of production and plans for increased uses, the markets should improve materially in the Fall. Waste papers are dull in sympathy with the remainder of the markets.

Paper Salesmen Plan Golf Outing

The next monthly golf tournament of the Middle West Division of the Salesmen's Association of the Paper Industry is to be held at the Cherry Hill Golf Club on Friday, August 21, according to H. F. Johnson, of the Brown Company, chairman of the golf committee. The salesmen are still talking about the big event at Westmoreland on July 24 when Warren Moore and Henry Johnson were the hosts to more than sixty golfers, including a whale of a long list of out of town visitors. A special prize for low net 18 holes was donated by these two gentlemen. Winners in the day's play were as follows: Low gross, Al Brown, Brown Paper Goods; low net, 18 holes, Cliff Spickerman, Whiting Plover Paper Company; low net 27 holes, Ray Russell, Marathon Paper Mills; low net foursome, 18 holes, Roy Giddings, Byron-Weston; Dick Ashby, Standard Paper Manufacturing Company; C. P. Sheldon, Northwest Paper Company; and Ed Beimfohr, Crocker-McElwain Company; low putts, Ernie Brown, Lawrence Bag Company, and blind bogey, Karl Becker, George W. Wheelwright Paper Company.

The low putt foursome consisted of D. C. Frisbie, Butler Paper Corporation; Courtney Reeves, of the Allied Paper Mills; Buzz Gibson, of Mosinee Paper Mills; and J. A. Hillman. The high gross foursome was made up of Ray Russell, Roy Jones, of the Harding-Jones Company; A. H. McDonough, and P. H. Oliver. The dubious honor of winning the high gross prize went to Roy Jones, of the Harding-Jones Company. The big feature of the day was the dinner event in the evening when more than sixty were on deck for the excellent meal and varied program.

Paperboard Industries Association Activities

From M. Pushker, of the Cook County Paper Stock Company, comes the information that action taken at the recent Paperboard Industries Association meeting was very favorable toward the Waste Paper Institute, of which Mr. Pushker is an executive. At the July meeting of the Paperboard group a resolution was passed which read "Resolved, that it is the consensus of opinion of the members of the Paperboard group of the Paperboard Industries Association that the 'Class A' or first class packer of waste paper is a necessary factor in the industry and that every reasonable encouragement be given by the consumers to those in a position to qualify as such." This valued recognition of the Waste Paper Institute will be a genuine boost to future activities of that organization and gives evidence of the desire of the Paperboard group to closely cooperate.

The September meeting of the Paperboard Industries Association will probably be held September 15, 16 and 17 at Niagara Falls, Ontario, Canada, according to a recommendation made at the July meeting and passed by the general session. A questionnaire is going out to all members in which they are asked to advise whether they prefer the annual meeting in November held in Chicago or New York City. The dates are November 17, 18 and 19. The report of transactions at the July meeting at Bluff-Point-On-The-Lake Champlain, New York State, includes an interesting account of the first golf tournament. More than forty prizes were awarded and so much fun was had that such a tournament will probably be held at at least one summer meeting during the year.

News of the Trade

There is considerable humor and an enervating whiff of optimism in the report from the publicity director of the Chicago Paper Association relative to the coming vacation of D. F. Peck, of the Hanchett Paper Company, president of the Association. Here it is: "The one and only D. Franklin Peck will be missing from the big summer outing of the Chicago Paper Association on August 10. It will be the first meeting at which Mr. Peck will not be present. The reason: an old friend has talked D. F. into embarking with him on a cruise to Georgian Bay and the Canadian Lakes. The time will be spent in fishing and champaigning. Old man Prosperity will pinch-hit for the inimitable D. F., who is president of the Chicago Paper Association, president of the Hanchett Paper Company, president of the D. F. Peck Paper Company, and who's only vice is that he is vice-president of the Crystal Tissue Company. His parting shot—'Business is not as poor as some people think it is.' D. F. honestly believes this to be a fact and if he performs in true Peck fashion business in parts north will be better." Incidentally the association is planning for a big program at the Bunker Hill Country Club on August 10. A day of golf, lunch and dinner plus other entertainment is sure to make the day an unforgettable one for those who attend.

The latest mailing of the West Virginia Pulp and Paper Company feature, Clear Spring English Finish Book, described as "a brilliant sheet with a plate finish." The inner fold portrays a striking black and white photograph which shows the quality of the paper for reproduction purposes. The paper comes in white or India tint.

THEY PUT dollars *in your pocket*

BIRD MACHINERY

Every piece of Bird Machinery helps make *better* paper, or *more* paper—or *both.* Check over these machines; they offer *sure* economies your mill can make *at once.*

The Bird Screen

Continuous machine production — lowest screening cost per ton — clean stock, with no lumps or slime—the world's standard screen, offering the greatest capacity and the highest quality stock that screens can achieve.

The Bird Centrifiner

The cleanest paper ever made—half the seconds—less sorting—more No. 1 sheets—better formation—easier and more satisfactory sales—eliminates sand traps and rifflers—eliminates complaints on account of dirt.

The Bird Save-All

Greatest profit on recovered stock — does everything the most elaborate machine can do, yet it's simple—easy and inexpensive to install and operate—uses fibre in water for sweetening—fits water for re-use.

Vickery Doctors

The Vickery Hi-Flex, for calender and supercalender rolls. The Vickery Hi-Angle for press rolls and dryers — the only doctors in the world that can be uniformly flexible under all conditions — automatically.

Vickery Felt Conditioner

Prevents shut-downs for washing and roping — uniform water removal — faster and more efficient drying — better paper quality — increased production.

BIRD MACHINE COMPANY
SOUTH WALPOLE ◆ MASSACHUSETTS

BIRD MACHINERY

5031

Abitibi Canyon Power Development Progresses

Construction Work On Big Plant Ahead of Schedule, Which Calls for Completion of Project By October Next Year—Huge Power House Will Have Generating Units of 55,000 h.p. Each—L. W. Killam Declares Pulp Stocks Below Normal

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., August 10, 1931—Work is progressing ahead of schedule on the 275,000 h.p. power plant of Ontario Power Service Corporation, a subsidiary of the Abitibi Power and Paper Company. The plant is located in the Abitibi Canyon, 64 miles north of Cochrane on the northward extension of the T. & N. O. Railway. Schedule calls for completion of the development in October, 1932. The general plan of the development provides for a dam in the gorge which will give a head of 237 feet and create a reservoir lake. A power house will be erected in the gorge below the dam and will have generating units of 55,000 h.p. each. Last week 1,515 men were busy on the work. Grubbing and stripping for the east and west embankment fills has been completed. Large amounts of rock have been removed from the gorge and from the spillway section of the dam. Concrete has been poured for the west wing wall as well as for the main dam and work has been started by the Dominion Bridge Company on the erection of the closure gates. To divert water out of the gorge during the construction of the dam and power house it was necessary first of all to bore and line two tunnels through the rock. These tunnels are now virtually complete and coffer dams upstream now divert the water through the tunnels. Thus the dewatering of the river section for the main dam has been completed and the river bottom is being placed in shape for the pouring of the main section of the dam. Later the two temporary tunnels will remain as reserve outlets for water. Main construction contract is in the hands of the Dominion Construction Company.

Wage reductions approximating 5 per cent for employees of the Abitibi Power and Paper Company have been agreed upon at last week's conferences at Iroquois Falls, Ont., between officials of the company and of the various unions with jurisdiction in the news print industry. The request for the reduction made recently by the company has been fully agreed to by the men. Officials of the concern and of the unions affected announced that they were well satisfied with the outcome of the sessions. J. E. Patterson, manager of operations, conducted negotiations on behalf of the Abitibi company, with T. E. Silver, resident manager at Iroquois Falls, representing that division. The unions were represented by M. J. Burns, International President of the Pulp and Sulphite Workers' Union; C. Ingles, vice-president of the Electrical Workers' Union, and R. Riley, organizer of the International Association of Machinists.

Sees General Pulp Shortage

With the exception of Japan, pulp stocks the world over are at a low point, according to Lawrence W. Killam, president of British Columbia Pulp and Paper Company, who is now in the east. Mr. Killam found that in the east buying was being done on a hand-to-mouth basis, but based on reports of his own representatives in Japan a surplus of pulp stocks existed there. The shortage of stocks may be attributed to the unsteadiness of the pulp market. Prices have been unjustifiably low in Mr. Killam's opinion, though the shortage of stocks creates a situation susceptible to rapid improvement as soon as there is a general quickening in demand. The pulp industry is dependent on the news print industry and when there is an advance in news print there should be a quick response in pulp, he said. Price cutting was referred to as one of the chief menaces of the pulp industry. So long as some mills disregard all attempts to set fair, basic prices, based on costs of production, Mr. Killam could not see any worthwhile stabilization.

Manitoba Pulpwood Exports

Reports from Winnipeg state that an effort is being made to have legislation rescinded prohibiting exportation of Manitoba pulpwood, since a lucrative trade is now being lost. It is contended that a revenue of $750,000 annually is lost, of which about $40,000 is being diverted from the provincial treasury. Some thirty years ago, about thirty of the smaller paper mills in Minnesota and Wisconsin were being supplied with Manitoba pulpwood. These mills, it is stated, are now being supplied by other sources. Pulpwood owners are endeavoring to get the law amended so that pocket-grinders may be installed in or near Winnipeg capable of grinding about 40,000 cords annually for shipment across the border.

Bates Valve Adopted by Flour Mill

One Bates Valve Bag unit has been installed in the Midland mill of the Copeland Flour Mills. As installed at Midland, the system employs paper bags in place of cotton or jute for the standard weight of 98 pounds. The bags are made in the patented form and are filled and weighed by automatic machines. Bates Valve Bag Company owns two factories in Canada for the manufacture of this type of bag, one at Three Rivers, Que., and the other at Dryden, Ont. The use of this equipment is a new departure in Canadian milling circles and its success may result in greatly increased use of paper bags.

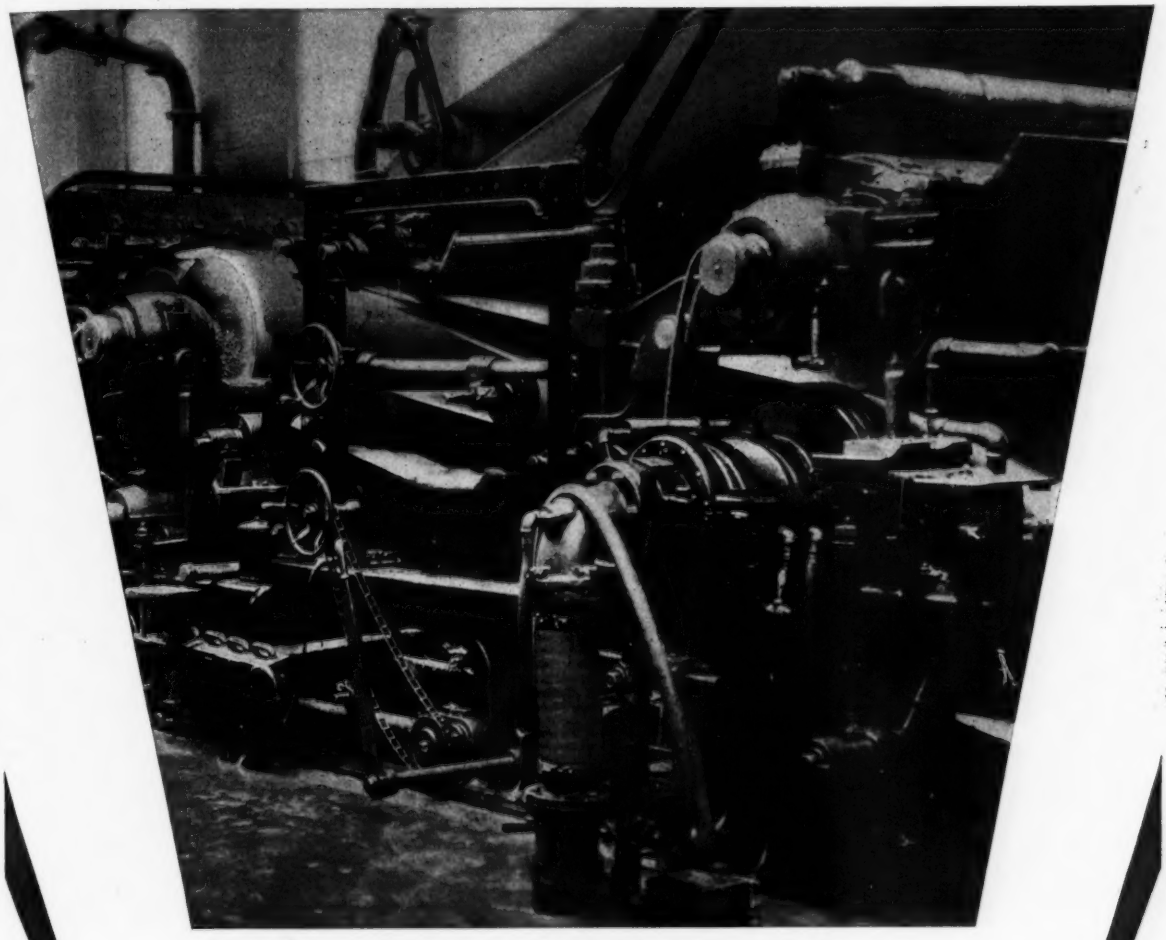
Robert Gair Company, through the election of E. Victor Donaldson, president of the company, and a former Toronto paper box manufacturer, to the board of directors of Maritime Paper Products, of Halifax, N. S., has extended its activities to Canada and holds a substantial interest in the Halifax concern. Maritime Paper Products, which was organized recently for the manufacture and sale of corrugated paper boxes and containers, recently commenced operations in Halifax. Mr. Donaldson was formerly head of the Rudd Paper Box Company in Toronto.

Half Yearly Dividends Earned

Both F. N. Burt Company and the Moore Corporation earned their dividends during the first six months of the present year. The companies are now into their second half-yearly periods and already some signs of improved business are apparent. As the last half of the year is always more important to these companies from a profits standpoint than the first half directors are confident that full year's dividends for both companies will be earned and paid. The various plants of the two companies are declared to be operating on a more efficient basis today than ever before.

Moore Corporation confines its operations to the manu-

DOWNINGTOWN



THIRD PRESS . . . . . SUCTION ROLL

The Laurentide Mill of the Canada Power and Paper Corporation at Grand Mere, Quebec, has eight Downingtown Suction Rolls in third press. The FIRST ONE was put in during 1923 and the remainder during 1925 and 1926. This is an impressive index as to the value of Third Press Suction Rolls on newsprint. Downingtown Suction Rolls are made in Cantilever and Standard Types and are fully adjustable while running. Their numerous features are fully described in our Catalog No. 103. Write for it. The Downingtown Manufacturing Company, Downingtown, Pennsylvania.

facture of manifolding business forms than can be produced by automatic machinery. This embraces a wide field of products, all made by similar processes, such as invoices, billing forms, cheque books, etc. Many exclusive patents in this field are controlled by the company most of them having been developed by the company's own production and research engineers.

The company's business covers both Canada and the United States, but the American field provides the majority of the sales, eleven of the fourteen plants being in the United States. The company is a holding corporation for several production units, each of which does a more or less localized business. Among the activities of the F. N. Burt Company is the manufacture of paper boxes, a large plant, that of Dominion Paper Boxes, Ltd., being located in Toronto.

Riverbend Mill Closed for Month

Lower demand for news print and consequent shortage of orders has necessitated the closure of the Riverbend mill of Price Brothers & Co. for three or four weeks. It is stated that most of the employes will be transferred to the Kenogami mill, so that the existing unemployment situation will not be aggravated. The Riverbend mill is the most recent addition to the Price news print plant. Built in 1925, it was enlarged in 1926 and in the early part of 1929 capacity was doubled, bringing output to 480 tons daily. This compares with a daily capacity of 550 tons at the Kenogami unit.

Notes and Jottings of the Trade

Don Clark, timber and pulpwood contractor, of Port Arthur, Ont., has completed negotiations through which he acquires the right to cut approximately 20,000 cords of pulpwood from Crown Lands on Magnet Point, Black Bay, about thirty miles from Port Arthur. Two hundred men will be placed in the bush and the work will occupy eight or nine months. The wood will be piled on the shore until a market can be found, and its approximate value will be $150,000.

John H. Brewin, 22-year-old son of the Rev. Canon F. H. Brewin, rector of St. Simon's Church, Toronto, was accidentally drowned while holidaying at the lakes near Peterboro, Ont. Deceased was formerly employed with the Interlake Tissue Mills at Thorold, Ont., and in the Howard Smith Mills at Montreal. The young man was popular among a wide circle of friends in paper and other circles.

R. B. Hall, manager of the Toronto office of the Howard Smith Paper Mills, is holidaying in Muskoka. Arthur Bobson, of the same office, has returned from the Kawartha Lakes district and Fred Hunt spent a couple of weeks in the same holiday grounds.

The C. V. Syrette Paper Company, Toronto, distributors of wrapping and other papers, has opened a branch office in Montreal at 222 Hospital street.

Hubert Biermans, who has been in Canada for the past few weeks on reorganization plans for the Canada Power and Paper Corporation, sailed for his home in Belgium a few days ago. Before leaving he expressed confidence that he would be able to get better terms of exchange for the holders of Belgo securities.

George Lawrence, of Dominion Envelope and Cartons (Western) Ltd., Winnipeg, arrived in Toronto a few days ago, having driven from the Manitoba capital to visit his parents in Toronto.

J. G. Emery, of the Alliance Paper Mills, has returned to Toronto, after spending a few weeks at his cottage in Muskoka.

Mohawk Papermakers Inc. Sold

[FROM OUR REGULAR CORRESPONDENT]

COHOES, N. Y., August 8, 1931—The mill property of the Mohawk Papermakers Inc., was sold to Louis R. Breslin, prominent business man, at a public auction held in the county courthouse building at Albany. For many years Mr. Breslin was a leading figure in knit goods circles as vice president of the old Waterford Knitting Company, and his experience is expected to prove valuable. The sale also includes the plant at Waterford.

The property was taken over subject to the new owner's agreement to satisfy the receiver's obligation. The sale was conducted under an order issued by Supreme Court Justice Cooper in a mortgage foreclosure action brought by holders of mortgage bonds amounting to $360,000. The plaintiff in the action was Kelley & Co., paper supply dealers, of Newark, N. J., which held one mortgage for $200,000 and another for $160,000 with interest at seven per cent.

It is said that Mr. Breslin acted as the representative of a new corporation which is now undergoing formation prior to taking over the operation of the business. Announcement is also made that the mills will continue to operate without interruption and some details regarding the plans of the new owners are expected to be made public within a few days. For the past several years Charles T. Wright has been looking after the affairs of the company as receiver. At the sale of the property the only bid placed was made by the new owner.

Amalgamated Paper Co. Expands

[FROM OUR REGULAR CORRESPONDENT]

FORT EDWARD, N. Y., August 10, 1931—Expansion plans for the Amalgamated Paper Company are now under way which will include the erection of a new structure adjoining the main plant here. Competitive bidding is now under way for the contract and it is expected that construction will be started within the next few weeks. The plans are said to call for a modern mill building, 50 by 150 feet.

Officials of the concern claim that it will be necessary to increase production about 50 per cent because of the increasing volume of orders. Since last spring the plant has been running day and night and the working force has been virtually doubled. A report filed early last month showed that business was ten per cent better than a year ago and the increasing growth has made it imperative to enlarge the manufacturing facilities. The estimates of the contractors are expected within a few days after which a decision will be made whether or not to proceed with plans.

The company turns out contracts for educational boards, colleges and private schools in all sections of the country, its principal products being paper and tablets. A considerable portion of the raw material used by the company is supplied by the local mill of the International Paper Company while some is also received from other mills in Northern New York.

More Russian Wood for Albany

[FROM OUR REGULAR CORRESPONDENT]

ALBANY, N. Y., August 10, 1931.—Another cargo of 3,000 cords of Russian pulpwood arrived at the local port this week when the ocean vessel Cliffwood docked here. The vessel came direct from Leningrad and is the second of a series of pulpwood ships expected to land here within the next few months. Unloading operations have already been started.

NATIONAL USS STAINLESS AND HEAT RESISTING STEEL PIPE and TUBES

NATIONAL SEAMLESS

U S S Chomium-Nickel Alloy Steels are produced under the licenses of the Chemical Foundation, Inc., New York; and Fried. Krupp A. G. of Germany

In addition to including the usual qualities of a high-grade seamless pipe or tube, U S S Chromium and Chrome-Nickel Alloy Steel Tubes offer the advantages of unusual corrosion resisting properties and improved strength at high temperatures as well as protection from certain acids.

This highly adaptable and superior tubular material presents important possibilities to the Paper Field. Information and suggestions for the application of such tubes for your purpose will be gladly furnished upon request.

U S S 18-8 CHROME-NICKEL—U S S 17 CHROMIUM
U S S 12 CHROMIUM

US STEEL

NATIONAL TUBE COMPANY

Frick Building, Pittsburgh, Pa.

QUALITY PRODUCTS — Dependable Service

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

PRINCIPAL SUBSIDIARY MANUFACTURING COMPANIES

AMERICAN BRIDGE COMPANY
AMERICAN SHEET AND TIN PLATE COMPANY
AMERICAN STEEL AND WIRE COMPANY
CARNEGIE STEEL COMPANY
COLUMBIA STEEL COMPANY
CYCLONE FENCE COMPANY
FEDERAL SHIPBUILDING AND DRY DOCK COMPANY
ILLINOIS STEEL COMPANY
MINNESOTA STEEL COMPANY
NATIONAL TUBE COMPANY
OIL WELL SUPPLY COMPANY
THE LORAIN STEEL COMPANY
TENNESSEE COAL, IRON & R. R. COMPANY
UNIVERSAL ATLAS CEMENT COMPANY

Pacific Coast Distributors—Columbia Steel Company, Russ Building, San Francisco, Calif. *Export Distributors*—United States Steel Products Company, 30 Church Street, New York, N. Y.

Philadelphia Paper Market Fairly Active

Growing Demand Experienced for Many Standard Grades of Paper — Excessive Heat Creates Wide Request for Various Summer Specialties—Consumption of Cellophane Continues to Expand—Fine Papers Moving In Moderate Volume

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., August 10, 1931—Through the dragginess of the summer season there is visible to the Philadelphia industry a brighter outlook indicating an upward trend in demand which already has begun for some of the grades of paper stocks, usually those of contract purchases from mills consumed by the large printing and publishing trades and in specialties that are needed by manufacturers. While such products as Cellophane and Cellophane faced bags and wraps, continue to soar in consumption there are other stocks of standard grades of book papers, better writings and summertime sanitary paper goods that are moving in fair volume and this brings to the industry a more hopeful outlook with the early August days.

While the demand for book papers grows, prices are at the lowest for the post war years, and yet, have not reached the pre-war levels which is a most encouraging phase of this division of the industry. Distributors of book papers under contract volume state that the attractiveness of prices that are the lowest of the current year and for the post war period, encourages consumers of these in bulk to place orders at this time. While the demand for book papers grows the mills campaign for sufficient tonnage to enable them to raise prices to a more profitable basis. Present day manufacturing of book papers cannot be carried on at pre-war levels so that there is little liklihood that the current values will recede and distributors look for advances rather than maintenance of rock bottom prices of the summer season. While orders grow, the tonnage now contracted by mill representatives and wholesalers of paper merchandise, is not on a parity with last year at this time when volume was considerably above the orders of the past month and of the early August days. Finer grades of writings are moving in a spotty market with fair orders in view of the conditions of the summer season.

Hot Weather Requirements Rise

Those wrapping paper merchants specializing in hot weather paper supplies and sanitary goods are encouraged with conditions as the rising mercury creates broader consumption. The demand for paper cups, ice cream and soda fountain supplies, outing paper specialties, food wraps and parchments, as well as waxed tissues, expands with the torrid days of mid-summer. Wrapping papers move sluggishly though prices hold firmly. Krafts are steady, though demand has not been materially stimulated in recent days following a spurt when the announcement of higher prices was made last month. Bags are in better demand and firmer. Building papers are slower.

Price & Pierce, Ltd., Offer New Products

Among the recent new offerings of Price & Pierce, Ltd., New York, just introduced to local distributors through the representative of that firm, E. McGoldrick, who traveled here last week, are the lines of specialties made by the Case Manufacturing Company, Unionville, Conn. They include such grades as pattern papers, papers used for manufacture of tubes and various lines of papers adapted for use by the tailoring and clothing manufacturing industries. These are an entirely new assortment of specialties for Price & Pierce, Ltd., and distribution of such lines should expand owing to the number of consuming industries that prevail here and in sections supplied through the Philadelphia paper merchants.

S. Walter Inc., Expands Up-State Trade

Following the acquisition of larger quarters late last Spring in the Up-State territory, located at 32 and 38 North Jordan street, Allentown, Pa., the subsidiary of the Philadelphia house of S. Walter Inc., known as the Lehigh Valley Paper House Division of S. Walter Inc., has been enabled to materially expand its lines of fine and wrapping papers and specialties distributed in that section. The new quarters occupy several thousand square feet of space in the two-story structure to which the business was removed from its old location along the Lehigh Valley Railroad. There have been installed new lines of prominent fine and wrapping papers manufacturers to augment those formerly carried.

Andrews Paper House to Add Lines

There will also be expanded the various lines of papers distributed in the York, Pa., branch of S. Walter Inc., the Andrews Paper House Division of S. Walter Inc., located on Pershing Avenue. Recently the York branch was equipped with additional executive, sales and display quarters by annexing adjoining space to the old quarters. Here also plans are under way for expansion of the papers distributed through the central section of the State and the adjoining territory to the York district.

Wolf Bros. Business Developments

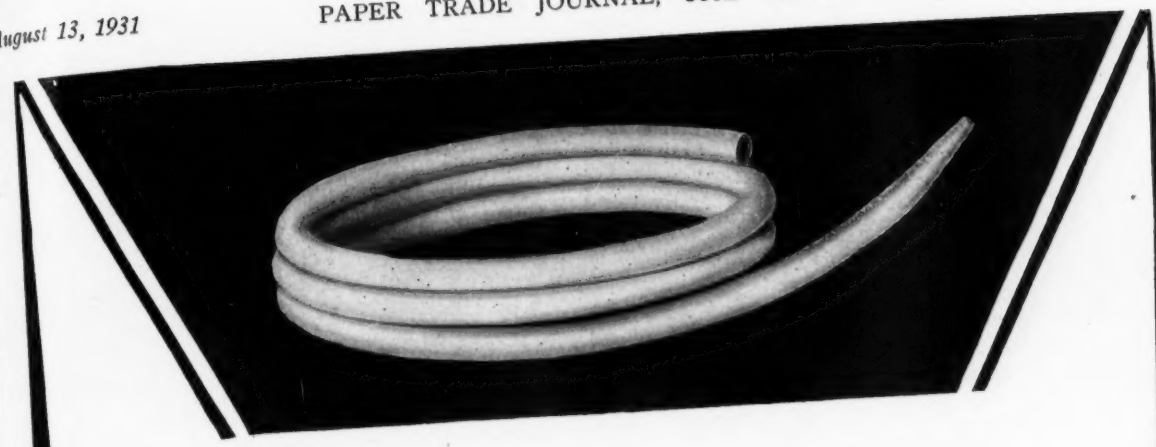
With the addition to the staff of Wolf Bros., manufacturers of bags, envelopes and drinking cups, high grade merchandise sacks and the Handelok Carry Bags, 340 North 12th street, of H. Lierz Brockermann to the advertising and sales promotion department, the firm prepares for the Fall season with a view to further expansions of its lines. Young Brockermann, matriculated from the University of Pennsylvania, Wharton School of Finance, in June, and is a son of William P. Brockermann, well known to the trade as a member of the staff of Wolf Bros., for more than thirty years.

Wolf Bros. Fancy Bag Portfolio

Wolf Bros. just have issued an attractive, new illustrated portfolio of their full line of fancy papers and special designs, in answer to a demand from paper jobbers for such a reference and guide for selection of papers used in manufacture of their line of merchandise bags. The popularity of the fancy bags, particularly the Handelok Carry Bag, among retailers and department stores, where the firm has a large following, has been consistent, the concern announced, and this portfolio resulted to aid sales of its products.

Sanitary Drinking In New Dispenser

Another development in the huge business enterprises of Wolf Bros., now occupying half a city square for its large five story plant, is the additional convenience of a new improved dispensing carton for their Standard Sanitary Drinking Cups which has facilitated sales. The new



THE SOFT NOZZLE IS OPTIONAL—

but there is no second choice for fineness

For wetting and washing down and for cleaning screen plates on paper machines, you need the sensible construction of this Goodyear "Style M" Sanitary Hose. Mills everywhere recommend it. It will save for you as it has for them.

This famous hose withstands dragging over brick or concrete pavements. It withstands being run over by paper trucks and continued flexing and bending. It offers tough resistance to acids and other process liquids. Because the rubber compounds are good for both low pressure steam and normal water pressures, you can use it alternately—a double purpose hose—for either steam or water.

When ordered *with a soft nozzle built in as part of the hose,* Goodyear Sanitary Hose protects screen wires from damage. This fine hose saves trouble and expense. At your hardest work, its stout construction insures long life and dependable mill service.

Let the G.T.M.—Goodyear Technical Man—tell you of other Goodyear Mechanical Rubber Goods that save in your industry. Hose, Packing, Transmission Belting—you should know of the help these can be when accurately specified to your needs. Just write to Goodyear, Akron, Ohio, or Los Angeles, California, and ask him to call.

THE GREATEST NAME IN RUBBER

GOODYEAR

BELTS • MOLDED GOODS • HOSE • PACKING

dispenser is designed for use either with or without a metal wall dispenser. There has been a marked increase in the sales of the specially patented standard cups to railroads, department stores, theatres, offices, factories and other large consumers, who require volume orders in compact flat designs of paper cups such as the Wolf Bros. produce and the factory facilities have been increased with equipment and packing devices to provide for this growing demand. Howard Wolf, of the firm, who reported the progress of his business states he is optimistic over the future and finds volume of demands normal for this season. He left August 1 to occupy his father's camp at Poland, Me., for the remainder of the summer.

Benjamin C. Betner Co. Expands

New window machines are being installed in the bag manufacturing plant of Benjamin C. Betner Company, at Devon, near Philadelphia. The new window machines will enable the firm to produce bags with cellophane windows. The Betner company is working on the perfection of its E-Z-C Bags and expects to have production started by September 1. The Betner company is also perfecting its own specially patented packeting machine which was exhibited at the recent packeting show held in New York. It is especially adapted for the consuming industries, such as coffee and spice manufacturers and like trades where packages are made of running commodities. The Betner company is now running a production of a million bags per week, producing such sacks as those used for coffee, teas, garments and chocolate coating purposes, both in fancy and plain papers and in glassines. The cellophane window bags will augment present production. In the closing months of last year the firm opened its new additional building which provided for several thousand more square feet of space in a modern, sanitary and fire proof structure along the Main Line Railroad. Several new machines were added to provide for the coming expansions and those of the early year, in plain and printed bags.

Garrett-Buchanan Co. Subsidiary Changes

Following the resignation of C. R. Van Reed from the management of the Wrapping Paper Division of the Van Reed Paper Company Division of the Garrett-Buchanan Company, located in Reading, Pa., and a subsidiary of the local firm of Garrett-Buchanan Company, 18-24 South 6th street, Leroy Killian, of the local staff has been appointed his successor. The new wrapping paper manager of the Van Reed Company, has been associated with the Philadelphia headquarters of the Garrett-Buchanan Company for the past eight years. He will take up his residence in Reading to be near his new quarters. Mr. Van Reed is a son of the founder of the Van Reed Paper Company, which is an outgrowth of the century old paper mill of the Van Reed Paper Company, and for many years was engaged in the distribution of paper in the Up State trade. He has been associated with the management of the company since the Garrett-Buchanan Company took over the business more than a year and a half ago.

Philip Carey Co. Repairs Rain Damages

The repairs to the plant of the Philip Carey Company, in Plymouth Meeting, in the Conshohocken District, of the damages caused in the recent heavy rains which washed out much property in that section are now under way. The plant suffered about the heaviest loss of any in that section and amounted to about $10,000, and upward. The company's quarry was 200 feet under water with valuable machinery at the bottom. Fire pumps have been brought to the scene to pump out the water from flooded cellars and the outbuildings as well as the quarry. The plant is devoted to production of magnesia coverings, insulation boards and materials and asbestos products, and is branch of the main offices and plant of Cincinnati, Ohio.

Discharged in Bankruptcy

Seide Seidel, trading as the Central Paper and Twine Company, 826 South 5th street, has received his discharge in voluntary bankruptcy instituted two months ago. He will continue business at the old address.

Paper Men Who Come and Go

President N. A. Considine, of the Paper House of Pennsylvania, who has been vacationing in New England and Canada, will return to his desk this week.

Howard Marcus, head of A. S. Datz & Son, leaves this week for a three weeks tour of Canada.

President Charles M. Levis, of Curtis & Bros., Newark paper mills located in Delaware, and headquarters in the Public Ledger Building, left last week to spend the month of August in the Adirondacks.

James Andrews, of the Schuylkill Paper Company, Lafayette Building, has returned from a three weeks sojourn at Orr's Island, Me.

Treasurer and Sales Manager David Back, of the Enterprise Paper Company, who has been making a tour of the paper mills in the Middle West has returned to his desk after a three weeks round of the manufacturers.

President Nathan Isen, of the Enterprise Company, leaves this week for a fortnight's sojourn in New England and Canada and will stop over at paper mills enroute.

Better Prospects for Willapa Mill

[FROM OUR REGULAR CORRESPONDENT]

PORTLAND, Ore., August 8, 1931.—The Willapa Pulp and Paper Company which was formed several years ago with plans to build a plant in the vicinity of South Bend or Raymond, Wn., but which in the meantime has passed through various vicissitudes of organization and financing, still has prospects of building the pulp mill when business conditions justify.

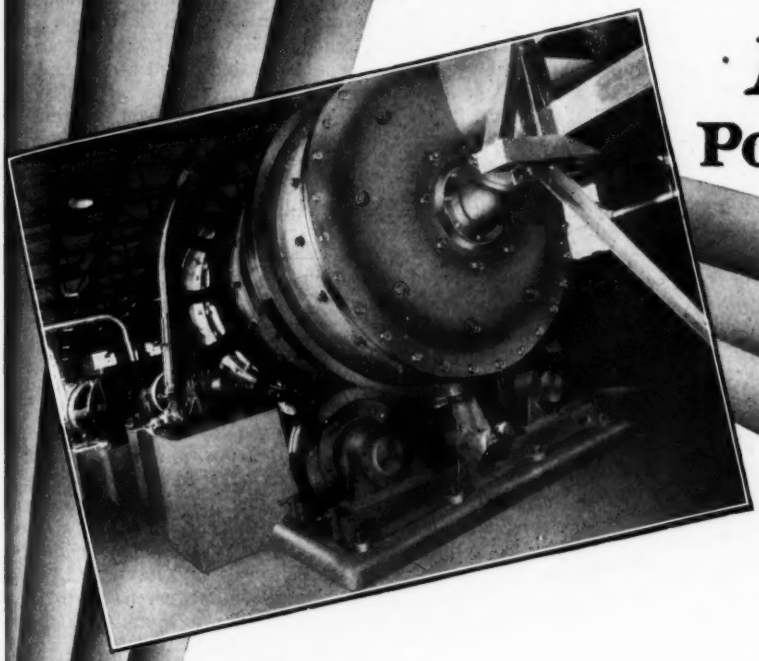
T. J. Mahoney of Portland, was elected president of the company at a recent meeting of the board of directors; Dr. Fred F. Thompson, The Dalles, vice president and Jay Bowerman, Portland, secretary-treasurer. A move was made to centralize the assets of the company and conserve the cash resulting from the initial stock sale which is said to have totaled $350,000. Another block of stock amounting to about $400,000 was traded for properties for the proposed plant. The amount due the company now from the past sale of stock is the issue at present.

Mersey Paper Mill Praised

J. Omansky, general manager of the *Philadelphia Record*, who has been visiting Nova Scotia, gave out an interview in Halifax in which he stated he had visited the mill of the Mersey Paper Company, of which his firm was a customer, and that the mill was the most efficient plant of the kind that he had seen; it was producing news print that was as good as the best on the continent. He further remarked that the company's steamer *Markland* had made her first trip to Philadelphia on July 3 with 1,500 tons of news print for the *Philadelphia Record*. "This," he said, "is the beginning of what we hope will be the continued use of Mersey paper by our newspaper. Nova Scotia really can become a tremendous producer of news print," he continued, "because it is so advantageously situated to serve the eastern seaboard more economically than either Ontario or Quebec. And thirty-five per cent of news print used in the United States is consumed on this seaboard."

MARCY ROD MILLS

Reduce Power Costs



MARCY ROD MILLS have shown a great reduction in power consumption per ton of finished product in all of the mills where they are now in operation. This is due to the large capacity made possible by the low pulp line and the large open end found only in Marcy Rod Mills.

We recommend a Marcy Rod Mill for beating and a modern washer for washing, doing a good job in each operation instead of washing and beating with one machine with indifferent results. The large open door of the Marcy Rod Mill gives the operator absolute control not obtainable in any other type of beater.

140 H.P. applied to two Marcy Rod Mills with 70 H.P. applied to one Jordan and 35 H.P. to a filter washer and white water pump will produce the same tonnage of a better quality board than is now produced by 350 H.P. applied to beaters and 150 H.P. applied to Jordans. This effects a saving in power of 60% and a very substantial saving in stock. Similar results are also shown in Kraft, Sulphite and Rag mills.

Our engineering department will be glad to consult with you in regard to your beating problems. You may also be interested in reading our bulletin *"Beating and Refining with a Marcy Rod Mill."* A copy will be sent to you on request.

The MINE and SMELTER SUPPLY COMPANY

PAPER MILL DIVISION

DENVER, COLORADO
1422-17th Street

NEW YORK CITY
225 Broadway

Manufactured for us in Canada by
WILLIAM HAMILTON, LIMITED
PETERBOROUGH, ONTARIO

MASSCO

Obituary

Philip Tell Dodge

Philip Tell Dodge, financier, who was president of the Mergenthaler Linotype Company for thirty-seven years and also president and chairman of the board of directors of the International Paper Company for eleven years, died Sunday, August 9, at his Summer home at 973 Forest Avenue, Rye, N. Y. He was 80 years old and had been suffering from an attack of bronchial pneumonia.

He is survived by his widow, Mrs. Lilias Sutherland Dodge, and a son and daughter by a previous marriage. They are Norman Dodge, who succeeded his father as president of the Linotype company four years ago, and Mrs. Thomas C. Musgrave, whose husband is a Colonel in the United States Army, now stationed at the War College in Washington.

In recognition of his wide interest in the basic publishing industries, Mr. Dodge was made president of the International Paper Company in 1914. He later became chairman of the board of the company, but resigned from active duty in 1925 to devote his time to other interests.

Mr. Dodge was born in Fond du Lac, Wis., on July 11, 1851, of a family which had resided in Schenectady, N. Y., for many years. His father, William Castle Dodge, had gone West a few years before his birth to publish a newspaper in Minnesota. The plant subsequently burned and the family returned to Schenectady, where Mr. Dodge obtained his first job, at the age of 10, in a machine shop.

He studied mechanical drawing at night and was promoted to the designing department of the shop. At this time, however, his family moved to Washington, where the elder Mr. Dodge became connected with a patent attorney's office.

The young man entered the law school of old Columbian College, now George Washington University, and was graduated as a patent attorney at the age of 22. He was subsequently active as a patent lawyer for twenty-five years, during which time he became interested in many inventions, particularly those relating to the printed word.

At the time of his election to the presidency of the International Paper Company, the organization was in financial straits and had not paid dividends on stock for several years. Under the direction of Mr. Dodge, the manufacturing plants of the company were greatly improved and a new mill was constructed at Three Rivers, Que., which at the time was the largest in the world.

Mr. Dodge was also prominently identified with many other enterprises. He was one of the early presidents of the Royal Typewriter Company and also headed the Columbia Phonograph Company for several years. He was a director of the Bank of New York and Trust Company, the American Surety Company, American Paper Exports, the Atlantic Coast Steamships Company, the Continental Paper Bag Company, the Fifth Avenue Coach Company and the St. Maurice Lumber Company.

For many years he maintained a New York home at 205 West Fifty-seventh Street, but more recently he had divided his time between a Winter home at 944 Park Avenue in New York and a Summer home at Rye.

His clubs included the Lotus, Union League, Engineers, New York Republican, St. Andrews Golf, Rockaway Hunting, New York Yacht, Larchmont Yacht and Metropolitan of Washington. He was also a founder and president of the Boys Club and was associated in other civic and philanthropic undertakings.

Frederick H. Babbitt

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., August 3, 1931.—Frederick H. Babbitt, for a number of years president of the Babbitt-Kelley Company, Bellows Falls, Vt., died at Phillips House, Massachusetts General Hospital, Boston, on Wednesday, aged 71. He had been ill for several weeks. Mr. Babbitt was born in Keene, N. H. He was a trustee of the Bellows Falls Village Corporation and acted as moderator of town meetings for many years. He served as a representative in the Vermont Legislature from Rockingham. In 1912 he was a state senator. He had been active in the Masonic fraternity and several years ago was Grand Master of the Grand Lodge of Vermont. A wife, a daughter, Mrs. Herbert T. Kelley, and a brother, John E. Babbitt, are living.

William A. Potter

[FROM OUR REGULAR CORRESPONDENT]

BROWNVILLE, N. Y., August 3, 1931—Word reached here this week of the death at Syracuse of William A. Potter, formerly superintendent of the plant of the International Paper Co. in this village. He came to this section in his youth and the experience in paper manufacturing he had resulted in the acceptance of a position with the International Paper Company. He grasped all details of the business quickly with the result that he was promoted to the superintendency, holding that position for about ten years. While serving in that capacity he made his home in Glen Park. About fifteen years ago he moved to Syracuse to take a responsible position with a large concern in that city. He is survived by his wife and two children.

German Pulp Producers Plan Cut

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 5, 1931.—Annual statement of large German chemical pulp producers, show the industry as still suffering from over-production and increasing difficulty in disposing of the product, according to a report from Consul William E. Deitz, Berlin, made public by the Department of Commerce. The 15 per cent curtailment of production effected by the Sulfit & Zellstoff Syndikat, founded in the autumn of 1920, has proved insufficient to meet the reduction in consumption this year. A further reduction of 15 to 30 per cent in sulphite pulp production was therefore agreed upon by the Syndikat at its last meeting in Oslo. This curtailment will be put into effect by the Swedish, German, Norwegian, Finnish and Czech industries. During the first half of the current year conditions in the German industry have been generally unsatisfactory, and it is believed that dividends can be distributed this year only if there is a material improvement during the last half of the year.

Cellophane Prices Reduced

The Du Pont Cellophane Company, Inc., has announced another reduction in the price of both plain and moistureproof Cellophane effective August 1, 1931.

This makes the thirteenth reduction since the manufacture of Cellophane was started by the du Pont organization seven years ago.

In commenting upon the announcement, du Pont officials stated the lower price was made possible by recent wide adoption of Cellophane in the cigarette field, as well as increased usage by the baking, textile and other industries.

A new plant is under construction at Buffalo at this time to provide additional production capacity.

We Dislike To Remind You

BUT WINTER WEATHER IS ONLY THREE OR FOUR MONTHS AWAY!

None too much time to plan and install needed equipment for effective and economical heating, ventilating and drying this winter. Condensation, drip, excessive drain on steam supply, lack of capacity on dryers and other common winter difficulties will soon be here to raise havoc with production and profit. The time to be ready is when the first chill blast strikes the roof and walls of your mill. Delay in planning now will mean delays and tie-ups later when they will prove costly. No mill can afford not to take advantage of every available economy. Check up on your weak spots now. Three months from now you'll enjoy the benefits of your preparedness. We are ready to help you analyze your requirements—from a small unit heater to a complete system. Write us.

J. O. ROSS ENGINEERING CORPORATION

201 No. Wells Street
CHICAGO

Main Office—122 East 42nd Street
NEW YORK

311 Lewis Building
PORTLAND, ORE.

ROSS ENGINEERING OF CANADA, LIMITED
New Birks Bldg., MONTREAL

ROSS SYSTEMS
HEATING—VENTILATING—DRYING

New York Trade Jottings

A. Robert Lowry, formerly associated with the Liberty Paper Company, and more recently with D. S. Walton & Co., has joined the sales force of the Tappen & Indruk Company, of 260 West Broadway, New York.

* * *

Great preparations are being made for the outing of the New York Association of Dealers in Paper Mills Supplies, which is to take place next Sunday, August 16, at Highlands, N. J. Tickets for the event may be obtained from F. H. Chase, of 518 Water street, New York.

* * *

The August outing of the Eastern Division of the Salesmen's Association of the Paper Industry is to be held at the Leewood Golf Club in Westchester County, New York, on Tuesday, August 15. Three or four prizes will be offered for competition in the golf tournament, and some of them will be for events which will give even the highest score men a chance.

* * *

H. H. Heinrich, of H. H. Heinrich, Inc., entertained his business friends, including local representatives of the leading trade papers, at a house warming celebration in his new quarters at 200 Varick street, New York. Following an excellent supper and appropriate refreshments, an informal demonstration of the new equipment of the Rubberprint Equipment Corporation was staged, and proved highly successful.

* * *

B. Lindell, formerly secretary and treasurer of the Scandinavian Pulp Agency, Inc., and more recently associated with the Perkins-Goodwin Company, has joined the Jay Madden Corporation, 100 East 42nd street, New York, as director of sales for their pulp department. The Madden Corporation is acting as sales agent in the United States for various Scandinavian pulp mills manufacturing the various grades of sulphite and kraft pulps and ground wood. The Madden corporation has established connections with Ekman & Company, of Gothenburg, Sweden, a firm which has been in business for over 100 years, as European associates.

Will of John Carlisle

WATERTOWN, N. Y., August 3, 1931—The will of the late John L. Carlisle, a director of the St. Regis Paper Company and a prominent business man until his death, was filed for probate this week by F. L. Carlisle, brother, and although no mention of the exact value of his estate is given it is believed that it will exceed $500,000. The widow, Mrs. Carrie C. Carlisle, is bequeathed the entire estate with the exception of a bequest of $10,000 to the House of the Good Samaritan in this city. The will was drawn and executed in December, 1929, and was witnessed by H. J. McCormick and S. F. Smith, business associates of the deceased. Floyd L. Carlisle and Mrs. Carrie C. Carlisle are named executors under terms of the document. Other than to set forth that the personal property and real property will each exceed $5,000 the petition gives no indication of the amount of the estate. It is understood that Mr. Carlisle also carried a large life insurance although the amount is not known.

H. A. Brody Killed in Auto Accident

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, August 10, 1931.—When on a week-end pleasure motor trip, Harry A. Brody, paper salesman and broker, and his wife and daughter, Aileen, were killed by a Pennsylvania train near Decatur, Ind., Friday afternoon, August 7, according to a message received here late in the afternoon of that day.

Mr. Brody and his family were enroute to Kalamazoo, Mich., and were proceeding north in Indiana after having crossed from the Ohio border. Mr. Brody was driving north at a fair rate of speed, unconscious of the fate that awaited him at a deadly grade crossing, about two and one-half miles north of Decatur.

His automobile was struck by a train which he did not see or hear until too late to avoid the crash. Both Brody and his wife were killed instantly, the car having been carried down the tracks for some distance before the engineer could check the speed of the train. Little Aileen, about seven years of age, lived a short time after the accident, having been alive when trainmen reached her.

The bodies were sent to a Decatur undertaking establishment and prepared for conveyance to this city. The Brodys lived in the Anna Apartments, 216 Yale Ave., an exclusive section of Dayton View.

The Brodys had visited friends and relatives in Kalamazoo previously. Although the Michigan city is a long distance from Dayton, the family would have arrived at its destination Friday evening but for the accident, having left this city early in the morning. Mr. Brody in driving into Indiana and driving in a straight line Northward, was taking the most direct route and following well-paved roads. Mr. Brody was about 37 years old and his wife 33.

At the time of his death, Mr. Brody was associated with the Blossom Company, paper brokers, Union Trust Building, Dayton. Employees of this company were aware of his intended week-end trip to Kalamazoo and said that he had made an early-morning start.

Mr. Brody formerly was identified with the Dayton Paper Stock Company and the Letellier-Phillips Paper Company.

Leaves American Tissue Mills

After being associated with the American Tissue Mills for the past 30 years as secretary, sales manager and salesman, and for the past ten years as Southern New England representative, F. R. Keens retires from the service of the company.

This is the third important resignation during the past month and closely follows the resignation of Vice President, W. H. Bond, who severed his connection after 40 years of continuous service. A. J. Hermanson, sales manager for the past year and a half resigned his post and returned to Chicago July 10.

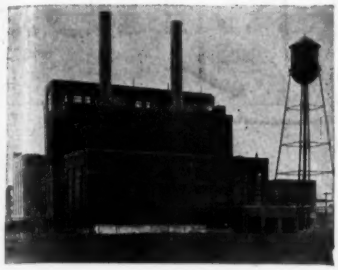
Knowlton Bros. Elect Officers

WATERTOWN, N. Y., August 11, 1931—At a special meeting of the stockholders of Knowlton Brothers held at their office here, August 10, 1931, the following directors were elected: G. S. Knowlton, Willis H. Howes, H. E. Harmon, J. C. McCormick, Theodore E. Knowlton.

At a meeting of the directors later, the following officers were elected: G. S. Knowlton, president; Willis H. Howes, vice president; H. E. Harmon, secretary and J. C. McCormick, treasurer.

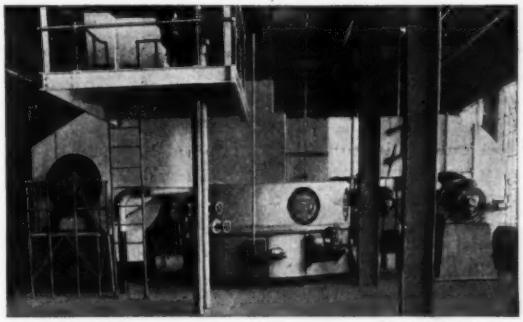
10 LJUNGSTROM PREHEATERS on 1000-HP. BOILERS

in three successive installations for the Viscose Company —the repeats came after proven commercial benefits



VISCOSE installed four units at Parkersburg, W. Va., in 1927, three at Lewistown, Pa., in 1928, and three in Meadville, Pa., in 1929.

At the Meadville, Pa., plant, the three superheater-equipped pulverized-coal-burning 10477-sq. ft. boilers operate 24 hr. per day at 450-lb. pressure, and at maximum rating each is capable of generating 150,000 lb. of steam per hr. Each boiler utilizes a Ljungstrom Independent-fan Type Preheater with 18090 sq. ft. of heating surface, to reduce the stack gas temperature from 825 deg. fahr. to 450 deg. in raising the combustion air temperature from 70 deg. to 610 deg. The efficiency of the boilers alone is 72 per cent, and with preheaters in service, 82.5 per cent, the increase with the preheaters effecting a fuel saving of 12.5 per cent.

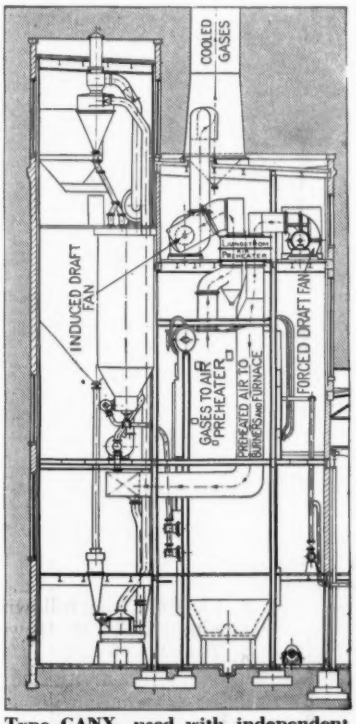


Typical installation at Meadville

The installations at Meadville, as typically shown in the elevation drawing, were the direct result of highly profitable performance under trying conditions at Parkersburg and Lewistown, where every imaginable provision had been considered for economical operation and substantial capacity increase at low investment cost.

The Ljungstrom Preheaters in all these plants do the equivalent work of boiler, furnace and fuel firing equipment at a reduced investment for an equivalent output and with the added advantage of fuel saving as above indicated.

The Ljungstrom Preheater, by reason of its 70 per cent recovery from small light weight low cost apparatus with negligible operating expense, repays its installation cost complete within one or two years, and thereafter effects a 10 to 15 per cent capacity increase or a 10 to 15 per cent fuel saving without increased fixed charges and with such low operating cost that the improvement is almost wholly *net cash commercial gain.*



Type CANX, used with independent draft fans of any make.

In these days of receding profits, the Ljungstrom Preheater is essential in a new plant, and in old plants fired with cold air, it offers the most practical means of increasing output at low cost or effecting high annual *net cash savings.*

Let our Engineers check your conditions and submit improvement guarantees together with references proving the quick and high money return.

THE AIR PREHEATER CORPORATION

40 E. 34th St., New York

Works: Wellsville, N. Y.: Agents in

Boston, Buffalo, Chicago, St. Louis, Charlotte, Detroit, Philadelphia, Cleveland, Indianapolis, Minneapolis, New Orleans, Pittsburgh, Cincinnati, San Francisco, Tacoma, Kansas City, Houston, Ft. Worth, Denver, Los Angeles, Salt Lake City, Portland, Seattle, Spokane.

Ljungström AIR PREHEATER

Reg. U.S. Pat. Off.

CONTINUOUS REGENERATIVE COUNTERFLOW

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Los Angeles, Cal.—The Crown-Willamette Paper Company, 343 Sansome street, San Francisco, Cal., has had plans completed by the Austin Company of California, Inc., 777 East Washington street, Los Angeles, engineer and contractor, for a new branch plant at East 12th and Evergreen streets, Los Angeles, consisting of a main one-story mill unit, 193 x 315 feet, and two-story office building, estimated to cost close to $300,000, with equipment. General contract for erection has been let to the Austin Company, and work will be placed under way at once.

Mount Holly Springs, Pa.—The Holly Gap Paper Company, Inc., recently organized by local interests, is planning the operation of a paper mill in this vicinity. It is understood that the company will take over an existing plant and remodel and improve. The new company is headed by Samuel E. D. Fry, Mount Holly Springs, heretofore superintendent at the local mill of the Holly Glen Paper Mill, who will be president of the new company. Harry A. Buttorff, Mount Holly Springs, will be treasurer. Harry C. Elsesser, York, Pa., is interested in the new organization.

Philadelphia, Pa.—The Penn Paper and Stock Company, 240 North Front street, has awarded a general contract to Melvin H. Grebe, 5 East Highland avenue, for improving and repairing its plant at 506-8 North American street, recently damaged by fire. The work is estimated to cost close to $15,000.

Cleveland, Ohio—The Industrial Rayon Corporation, West 98th street and Walford avenue, is arranging plans for expansion at its local mill, with the establishment of a new producing unit for the manufacture of transparent cellulose paper stocks. The program is reported to cost over $150,000, with equipment. Hiram S. Rivitz is president.

Yarmouth, Me.—The Forest Paper Company, Yarmouth, is said to be planning the rebuilding of portion of local mill, damaged by fire on August 4, with loss reported at close to $50,000, including equipment. Reconstruction is expected to cost approximately a like sum.

Hodge, La.—In connection with an expansion program now under way at the plant of the Southern Advance Bag and Paper Company, Inc., Hodge, parent organization, the Advance Bag and Paper Company, Inc., 38 Newbury street, Boston, Mass., is said to be arranging for immediate removal of machinery from its mill at Howland, Me., to the Hodge plant, where production will be concentrated largely in the future. The work at the Hodge mill includes several new structural steel units, which will be given over to paper-making. It is proposed to double the present capacity of the local kraft paper mill. It is understood that no changes will be made in the bag and container-manufacturing division at the Hodge plant, and that manufacture will be maintained on the present mill basis. Company has recently awarded a contract to the Louisiana Power and Light Company, New Orleans, La., for power supply for the new paper-making division, and the utility company will place work under way on the construction of a power line from its generating plant at Sterlington, La., to Hodge, about 25 miles, for that purpose, estimated to cost close to $100,000. The entire development program is reported to represent an investment of over $400,000.

Plattsburg, N. Y.—The Diamond Match Company, 30 Church street, New York, is said to be concluding arrangements for purchase of properties of the Saranac Pulp and Paper Company, Inc., Plattsburg, and will use for expansion in operations. The plant and properties are said to be valued at close to $1,750,000, and include a long-term contract with Saranac River Power Corporation, Plattsburg, for power supply at the plant. The Diamond Match Company is now operating a plant at Oswego, N. Y., as well as factories in the Middle West and on the Pacific Coast.

Kingsport, Tenn.—The Tennessee-Eastman Corporation, Kingsport, has work nearing completion on superstructure for a new plant unit at local cellulose acetate mill, to be one and four-story, 100 x 580 feet. It is proposed to begin installation of machinery at early date, and to have the plant ready for service in the fall. The new mill will represent an investment of close to $1,000,000, with machinery. The company is affiliated with the Eastman Kodak Company, Kodak Park, Rochester, N. Y. Engineering department is in charge. Contract for erection has been carried out by the Ridge Construction Corporation, 335 Lewiston avenue, Rochester.

Newark, N. J.—The Sanitary Products Corporation, 652 Ogden street, local representative and distributor for the Crown-Zellerbach Corporation, San Francisco, Cal., manufacturer of paper drinking cups, containers, tissue stocks, etc., has leased a portion of the building at 271-77 Badger avenue, and will occupy for a new storage and distributing plant. Present plant will be removed to the new location and operations concentrated at that point.

San Francisco, Cal.—The United Paper Box Company, Eighteenth and Bryant streets, is considering the early rebuilding of portion of plant recently destroyed by fire with loss reported in excess of $200,000, including building, equipment and stock.

North Chelmsford, Mass.—The Bast Fibres Corporation, recently organized to manufacture fibre products, occupying a portion of the local Silesia Mills, has discontinued operations after a few months of activity and the plant has been closed down. The machinery will be removed and sold in small lots. John J. Raskob, Jr., was head of the project.

"M & W" DEPENDABLE RECORDS

Eliminate delay in getting Repairs to your Equipment

and insure accurate fit of Replacement Parts

One of our customers said to us the other day—"You fellows certainly can supply accurate replacement parts quick."

It's a mighty comforting thought to know that whenever you need them, you can get duplicates, on short notice, for any parts of your "M & W" machines, that may have become broken or worn out.

In our big, fireproof vaults we keep complete records of all machines built by us, so that when ordering repairs you are assured of quick service, thus enabling you to start up the machine without a hitch. Loss in production is reduced to a minimum.

If you have any alterations or repairs in view—write us for an estimate . . .

Keep the efficiency of your machines at the maximum. Repair "M & W" machinery with "M & W" parts. Do not use makeshifts.

●

THE MOORE & WHITE COMPANY

Paper Mill Machinery

FIFTEENTH ST. AND LEHIGH AVE. **PHILADELPHIA, PA.**

Longview, Wash.—The Weyerhaeuser Timber Company, Tacoma, Wash., has recently awarded a contract to the General Electric Company, Schenectady, N. Y., for motor equipment required for its new pulp mill at Longview, on which work is nearing completion. The order calls for about 100 individual motor units of various horsepower up to 200-hp., with controls and accessory apparatus. The company is said to be planning to place the pulp mill in service in the fall.

New York, N. Y.—The United Engineering Company, 1860 Broadway, New York, is completing arrangements for the construction and operation of a new plant in the vicinity of Havana, Cuba, for the production of paper book matches, unit to include a paper converting division for paper wrappers in forms of books, etc. The entire plant is reported to cost close to $325,000, of which about $250,000 will be expended for machinery and equipment. Russell W. Smith is president of the company.

Hoquiam, Wash.—The Grays Harbor Pulp and Paper Company, Hoquiam, is now operating on a basis of about 80 per cent of capacity, and expects to continue on that schedule for an indefinite period. Close to normal working quota is being employed.

Sault Ste. Marie, Ont.—The Abitibi Power and Paper Company, Ltd., Iroquois Falls, Ont., is planning early resumption of production at its local mill, following a shut down for a number of weeks. It is expected to start up on or about September 1, giving employment to over 400 workers until further notice. The company has announced a wage reduction of 5 per cent at its Iroquois Falls mills, effective August 1. This is one of the few plants of the company on close to normal production schedule, several mills being closed down entirely and the plant at Pine Falls, Man., is on a part time schedule.

New Companies, Etc.

New York, N. Y.—Automatic Paper Dispensers, Inc., New York, has been incorporated with a capital of $40,000, to manufacture paper products of various kinds. The incorporators include Julius J. Corn, 76 Madison avenue, New York; and Elias H. Kamy, 407 Ocean avenue, Lakewood, N. J.

Toledo, Ohio—The Singer Paper and Metal Co., Toledo, has been incorporated with a capital of 250 shares of stock, no par value, to deal in waste paper, etc. The incorporators are Morris Besk and Isadore Singer. The company is represented by Harry Levison, Spitzer Building, Toledo, an attorney.

Chicago, Ill.—The Illinois School Tablet Co., 160 North La Salle street, has been incorporated with a capital of $10,000, to manufacture and deal in writing tablets and other papers. The incorporators are Abraham Kirson and F. Weinberg.

St. Petersburg, Fla.—The Parker Paper Company has been organized by N. W. Parker, 2220 Nineteenth avenue, South, St. Petersburg, and associates, to deal in paper goods of various kinds.

Kalamazoo, Mich.—The Western Board and Paper Company, Kalamazoo, operating with a capital of $250,000, has filed notice of company dissolution under state laws.

Philadelphia, Pa.—The City Wall Paper Company, 1511 North 21st street, has filed notice of organization to deal in wall papers, etc. Philip Schnee, Bridgeport, Conn., heads the company.

Chicago, Ill.—The Perry Wall Paper Company, Chicago, has filed notice of company dissolution under state laws.

Boston Paper Trade Happenings

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., August 10, 1931.—A bill of equity, asking for a receiver for the Geo. W. Wheelwright Paper Company, of Leominster, Mass., was filed in Suffolk Superior Court August 6 by the Train Smith Company. It is declared in the bill that the Wheelwright company, who have been in business more than fifty years, made a series of notes for a total of $447,469.63, due August 1, and that they have not been paid. It is further set forth that $218,389.73 is owed to various creditors.

The Deerfield Glassine Company, Monroe Bridge, Mass., continues to operate full time on the two machines. The better grades of stock are in more demand than the lower-priced ones. It is stated that embossed glassine is moving better in the Philadelphia and New York markets. Norman E. Scott, Boston representative of the company, has returned from a business trip to Western New York.

James D. Heffernan, Boston representative of the Whiting Paper Company, Holyoke, Mass., who has been away from his office three weeks on account of illness, is expected to return this week and will be there a few hours each day. Mr. Heffernan is at Nantasket Beach with his family.

Henry L. Goodman, 110 High street, who handles several papers, including fancy lines, leaves Saturday on a motor trip to Lake Willoughby, Vermont, where he will stay a week or ten days, and play golf during part of his visit. He will then motor to Canada and return via New York State. Mr. Goodman expects to be away from two to three weeks.

N. S. Clark, president of Knight, Allen & Clark, Inc., goes next week for a fortnight's vacation at Gilmanton, N. H.

T. M. Dix, first vice-president of Spaulding & Tewksbury Company, has returned from a vacation at Moultonboro, N. H.

L. B. Tewksbury, second vice-president of Spaulding & Tewksbury Company, accompanied by Mrs. Tewksbury, left Sunday for a trip to the Adirondacks.

William N. Stetson, Jr., president of Storrs & Bement Company is passing his vacation in Maine.

Mersey Paper Has Satisfactory Year

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., August 10, 1931—Report on the first full year's operations of the Mersey Paper Company shows bond interest met, with a substantial allowance for depreciation, and earnings sufficient to meet dividends on the cumulative preference shares. Gross profits for the year were $852,921, at a time when an intensive campaign was necessary to introduce the company's products to the market in the United States.

The reserve for depreciation accounted for $240,000 of the gross earnings; interest on funded debt and other loans of $172,701.

Current assets include accounts receivable, $509,086.46, and inventories of logs, pulp, finished paper, etc., $882,672, which with small items brings the total to $1,403,190. Fixed assets are valued at $12,700,224, including real estate, timber limits, plant, machinery, etc.

"Your directors consider the results as satisfactory, particularly in view of the fact that the statements reflect the first year of the company's operations, and that throughout the year the news print trade was passing through a period of abnormal depression," Col. C. H. L. Jones, president, states in his letter to shareholders.

In YOUR Advertising Can You Say This:

"Our papers are made by modern machinery— under laboratory control!"

THE spot-light of paper buying is falling more and more upon *quality*.

Take the printer, for example. His demands upon the paper industry for quality are constantly increasing.

Quality mills on a low cost basis are getting more and more of the printers' business.

And they are doing it with the indispensable aid of modern, up-to-date laboratories — complete, miniature mills in which tests comparable to actual mill runs can be made.

We have just issued a new Bulletin which contains a detailed, authoritative discussion on the modern laboratory and the various functions performed by Valley Laboratory Equipment. Write the Valley Iron Works Co., Appleton, Wisconsin for a copy of this Bulletin.

LABORATORY EQUIPMENT INCLUDES:

Beater	Hot Plate	Flat Screen
Sheet Mould	Size Tester	Couch Roll
Hydraulic Press	Drying Oven	Jordan

VALLEY

Equipment for Paper and Pulp Mills

Plant: Appleton, Wisconsin
New York Office: 350 Madison Ave.
Canadian Representatives: Pulp & Paper Mill Accessories, Ltd., Montreal, Canada

OTHER "VALLEY" EQUIPMENT

Beaters	Deckers	Screw Presses
Plug Valves	Pumps	Laboratory Equipment
Stock Regulators	Jordans	

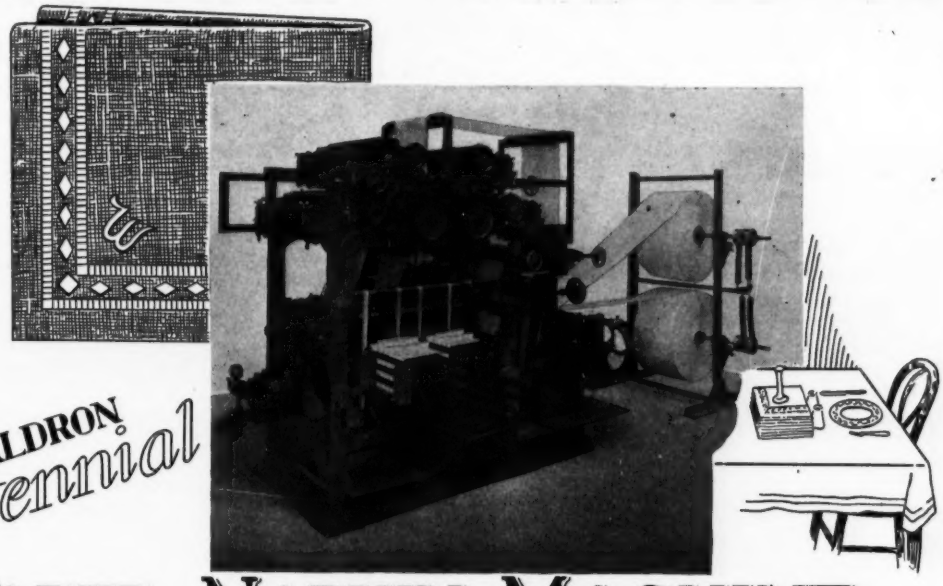
PAPER AND PAPER STOCK IMPORTS AND EXPORTS OF THE UNITED STATES

For the Month Ending May 31, and for the Five Months Ending May 31, 1931 Compared with Corresponding Month of Previous Year

IMPORTS—PAPER

	May				Five Months Ending May 31			
	1930		1931		1930		1931	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
PAPER AND MANUFACTURES	.....	$13,545,175	.....	$12,195,662	.....	$62,059,431	.....	$54,730,786
Printing paper—								
Standard news print ....lbs...free	415,210,123	12,132,371	385,376,031	10,437,211	1,867,773,470	54,489,531	1,722,004,006	48,048,266
Imports from:								
Finland ....lbs.	5,953,918	136,059	7,767,470	177,232	38,796,286	895,512	35,638,100	821,096
Germany ....lbs.	2,510,339	60,942	2,974,134	63,290	9,900,918	242,204	18,888,592	409,977
Norway ....lbs.	714,809	16,964	992,890	24,871	7,240,071	172,280	17,279,350	440,488
Sweden ....lbs.	11,147,786	274,594	4,936,765	120,300	61,542,885	1,520,295	49,030,156	1,128,003
Canada ....lbs.	370,835,331	10,956,121	328,815,496	8,993,687	1,681,294,330	49,691,311	1,509,204,111	42,772,126
Newfoundland and Labrador....lbs.	24,047,940	687,691	39,889,276	1,057,831	68,998,980	1,967,929	91,893,725	2,474,846
Other countries ....lbs.	.....	.....	.....	.....	.....	.....	69,972	1,730
All other, n. e. s....lbs...dut.	261,302	10,921	293,622	8,067	1,200,649	56,417	1,008,637	33,924
Greaseproof and waterproof papers....lbs...dut.	62,492	17,573	26,367	4,313	669,619	227,930	146,821	29,184
Kraft wrapping paper....lbs...dut.	647,859	26,173	360,347	14,300	3,878,413	155,992	1,464,120	62,045
Other wrapping paper....lbs...dut.	284,708	12,936	144,209	9,959	1,074,900	61,208	1,392,439	58,515
Writing and drawing paper, etc.....lbs...dut.	289,407	75,024	206,865	44,635	1,623,531	417,071	1,048,629	210,293
Writing paper and envelope combinations ....dut.	.....	.....	.....	16,407	.....	.....	.....	72,725
Surface-coated paper ....lbs...dut.	156,181	64,567	153,804	71,054	966,551	379,173	474,851	214,957
Uncoated paper, decorated or embossed.lbs...dut.	.....	.....	21,957	4,447	.....	.....	74,957	16,873
Tissue and similar papers....lbs...dut.	402,410	251,224	.....	.....	1,919,704	1,034,901	.....	.....
Weighing not over 6 pounds to the ream ....lbs...dut.	.....	.....	164,928	126,074	.....	.....	647,201	458,957
Other ....lbs...dut.	.....	.....	50,416	17,652	.....	.....	306,790	128,687
Paper boards, n. e. s.—								
Pulp board, in rolls....lbs...dut.	5,184,361	114,143	2,374,674	49,944	23,277,512	541,516	13,369,202	291,753
Paper board, pulp board, n. e. s., and card board ....lbs...dut.	1,306,391	29,864	721,782	13,793	6,847,262	163,857	5,787,105	132,894
Leather board, test and wall board..lbs...dut.	175,417	7,385	153,348	7,360	688,608	34,446	650,342	34,143
Cigarette paper, cigarette books, and covers ....lbs...dut.	1,008,687	341,594	3,956,041	1,017,675	5,308,416	1,833,583	12,268,237	3,175,010
Hanging paper (wall paper)....lbs...dut.	101,936	48,194	30,599	17,547	1,308,831	361,359	684,105	181,932
Duplex decalcomania paper, not printed..lbs...free	32,776	7,821	66,465	14,400	217,150	51,616	222,031	49,436
Paper boxes ....dut.	.....	129,305	.....	91,130	.....	585,987	.....	406,155
Papier-mâché and pulp manufacturers, n. e. s. ....dut.	.....	27,120	.....	20,387	.....	268,246	.....	145,805
All other paper and manufactures....dut.	.....	248,960	.....	209,307	.....	1,396,598	.....	979,232
WOOD PULP								
Mechanically ground wood pulp.....tons..free	15,526	430,192	.....	.....	118,403	3,315,727	.....	.....
Unbleached ....tons..free	.....	.....	10,356	279,146	.....	.....	68,243	1,731,921
Bleached ....tons..free	.....	.....	1,118	24,624	.....	.....	3,799	90,557
Sulphite wood pulp....tons	65,031	3,842,016	56,336	2,792,302	420,627	24,664,506	349,144	17,737,547
Unbleached ....tons..free	42,182	2,187,652	30,788	1,198,011	283,234	14,603,537	211,934	9,189,669
Bleached ....tons..free	22,849	1,654,364	25,548	1,594,291	137,393	10,060,969	137,210	8,547,878
Imports from:								
Finland ....tons	6,709	337,059	7,559	304,311	41,061	2,084,589	38,861	1,633,677
Germany ....tons	3,148	201,988	4,436	250,881	31,491	2,126,291	26,019	1,525,038
Norway ....tons	6,005	367,332	275	15,918	28,037	1,811,719	16,996	879,917
Sweden ....tons	20,573	1,168,041	18,751	751,768	154,363	8,479,872	136,675	6,255,740
Canada ....tons	26,607	1,653,289	23,383	1,381,138	158,115	9,766,078	118,096	6,890,375
Other countries ....tons	1,989	114,307	1,932	88,286	7,560	395,957	12,497	552,800
Sulphate wood pulp, unbleached (kraft pulp) ....tons..free	22,660	1,095,110	11,865	432,535	148,283	7,493,712	95,742	3,882,430
Imports from:								
Finland ....tons	3,950	188,579	2,419	64,967	17,937	818,392	10,899	327,106
Norway ....tons	860	34,404	.....	.....	6,109	291,115	2,417	82,405
Sweden ....tons	11,011	478,197	7,098	233,301	87,182	4,165,159	64,977	2,391,749
Canada ....tons	6,225	368,821	2,294	132,532	34,232	2,093,876	16,904	1,064,616
Other countries ....tons	614	25,109	54	1,735	2,823	125,170	545	16,554
Sulphate wood pulp, bleached.....tons..free	1,670	143,515	1,768	146,855	5,437	447,228	16,513	1,100,294
Soda pulp ....tons..free	.....	.....	294	15,961	.....	.....	1,710	92,267
Other pulp ....tons..free	362	26,397	65	5,459	1,906	138,931	108	9,527
CRUDE PAPER STOCK								
Rags for paper stock....lbs...free	30,333,061	574,174	10,610,984	143,133	165,788,090	3,479,514	53,218,326	715,006
All other paper stock....lbs...free	19,948,498	326,360	9,959,366	169,346	109,147,150	1,695,405	48,549,286	754,627
CHEMICALS AND OTHER PAPER MAKERS' MATERIALS								
Colors, dyes, stains, color acids, and color bases, n. e. s....lbs...dut.	362,890	380,555	480,933	513,093	2,234,339	2,409,748	2,037,673	2,333,424
Imports from:								
Belgium ....lbs.	7,683	9,276	5,570	8,733	24,543	28,141	24,072	30,846
France ....lbs.	1,471	1,428	7,843	15,167	13,528	17,797	49,381	77,304
Germany ....lbs.	263,585	279,279	280,875	269,036	1,486,474	1,614,394	1,104,220	1,198,048
Italy ....lbs.	.....	.....	.....	.....	.....	.....	11,278	10,814
Switzerland ....lbs.	82,783	83,647	169,657	195,972	655,608	699,758	775,444	935,029
United Kingdom ....lbs.	6,395	5,754	11,669	18,215	31,896	31,373	52,335	56,918
Other countries ....lbs.	923	1,171	5,319	5,970	22,290	18,285	20,943	24,465
China clay or kaolin....tons..dut.	11,510	124,693	12,418	106,041	112,554	1,193,048	56,398	502,881
Casein or lactarene ....lbs...dut.	4,287,702	439,545	470,734	20,687	15,669,633	1,745,587	1,934,957	92,325

(Continued on page 34)



WALDRON *Centennial*

PAPER NAPKIN MACHINE

printing—embossing—folding—counting
—all operations on this one machine

New Profitable Production for Paper Manufacturers

The development of the Centennial Combination Machine has provided an additional source of profit for the manufacturer as well as converter of light weight papers.

Manufacturing cost greatly reduced—popular quality napkins now in profitable production! All necessary operations performed in sequence on 500 napkins or serviettes per minute without undue wear or vibration. Beautifully embossed, printed one, two or three colors, smooth sheer cut, quarter folded, counted and delivered. With minimum cost for maximum quantity of output—fast, positive, profitable—the Centennial Combination Machine removes all previously existing limitations in the production of quality paper napkins.

New 16 Page Catalog Is Now Ready!

It illustrates and describes the equipment in detail and explains special assemblies for special production requirements. Copy will be gladly sent upon request.

JOHN WALDRON CORPORATION

MAIN OFFICE AND WORKS—NEW BRUNSWICK, N. J.

NEW YORK
122 East 42nd St.

CHICAGO
201 N. Wells Street

PORTLAND, ORE.
311 Lewis Bldg.

WALDRON

Paper Converting Machinery

PAPER AND PAPER STOCK IMPORTS AND EXPORTS OF THE UNITED STATES

(Continued from page 32)

EXPORTS—PAPER

	May 1930 Quantity	May 1930 Value	May 1931 Quantity	May 1931 Value	Five Months Ending May 31 1930 Quantity	Five Months Ending May 31 1930 Value	Five Months Ending May 31 1931 Quantity	Five Months Ending May 31 1931 Value
PAPER AND MANUFACTURES	.....	$2,757,701	.....	$2,194,329	.....	$14,239,225	.....	$10,190,118
Printing paper—								
News print paper ..... lbs.	1,316,582	48,327	1,096,963	35,902	10,270,387	420,158	7,238,485	245,607
Exports to:								
Europe ..... lbs.	49,946	1,112	41,324	1,800	785,173	44,848	696,736	25,178
Canada ..... lbs.	1,894	80	61,792	2,793	19,245	843	71,274	3,205
Central America ..... lbs.	48,497	1,787	110,490	3,642	725,293	26,214	491,537	16,707
Cuba ..... lbs.	264,928	9,728	258,174	8,478	1,397,454	55,862	1,620,378	60,232
South America ..... lbs.	427,014	15,142	129,066	4,078	2,534,145	84,219	761,751	24,818
China, Hong Kong, and Kwantung ... lbs.	.....	.....	.....	.....	1,493,888	85,128	150,267	3,813
Philippine Islands ..... lbs.	410,470	15,585	400,683	12,051	2,826,226	100,913	3,157,302	100,539
Other countries ..... lbs.	113,833	4,893	95,434	3,060	488,963	22,131	289,240	11,115
Book paper, not coated ..... lbs.	2,930,535	197,626	1,256,880	82,509	17,051,576	1,126,344	7,462,075	485,759
Exports to:								
Europe ..... lbs.	20,449	3,117	20,032	2,090	320,294	30,487	151,860	12,484
Canada ..... lbs.	1,221,303	71,112	353,521	19,987	4,825,824	283,304	1,858,267	111,989
Mexico ..... lbs.	42,674	4,667	30,185	3,080	327,419	33,894	197,748	20,180
Cuba ..... lbs.	626,253	41,210	221,196	15,684	2,006,780	137,474	1,089,192	71,776
Argentina ..... lbs.	215,492	19,525	17,439	2,007	643,867	48,375	474,317	27,310
Other South America ..... lbs.	78,068	6,652	126,966	9,333	821,118	62,881	471,549	34,516
China, Hong Kong, and Kwantung ... lbs.	301,051	18,866	176,750	9,936	4,058,441	247,918	1,023,356	57,452
Philippine Islands ..... lbs.	171,027	10,856	90,851	6,318	2,176,237	136,252	974,922	67,365
Australia ..... lbs.	16,966	1,804	66,393	3,550	492,433	38,022	538,533	29,884
Other countries ..... lbs.	237,251	19,817	153,547	10,524	1,379,163	107,737	682,331	52,803
Cover paper ..... lbs.	188,239	31,211	153,476	26,866	1,038,836	168,608	776,484	118,923
Greaseproof and waterproof paper ..... lbs.	286,590	60,699	296,020	68,809	1,405,788	268,771	2,102,418	396,823
Overissue and old newspapers ..... lbs.	16,619,277	134,172	19,061,909	128,338	70,871,646	612,424	75,207,776	542,464
Wrapping paper ..... lbs.	3,224,079	186,843	2,278,865	140,427	20,439,641	1,289,359	14,214,171	741,513
Surface-coated paper ..... lbs.	750,530	87,067	362,192	53,200	4,347,870	476,992	2,540,694	284,925
Tissue and crepe paper ..... lbs.	386,019	84,912	213,910	39,600	2,342,674	428,616	1,364,703	224,939
Toilet paper ..... lbs.	572,299	62,520	704,616	71,284	3,146,417	347,257	3,231,952	356,030
Paper towels and napkins ..... lbs.	343,018	38,731	372,684	33,723	1,748,981	200,841	1,614,071	152,486
Boxboard (paperboard and strawboard) ..... lbs.	8,348,736	188,092	8,046,462	191,451	29,080,270	711,165	26,725,325	619,195
Bristols and bristol board ..... lbs.	111,962	12,619	130,512	13,356	1,053,357	97,436	880,483	90,399
Other paper board ..... lbs.	4,370,943	184,338	11,079,081	280,928	16,956,496	823,315	20,566,123	716,452
Sheathing and building paper ..... lbs.	1,842,421	54,730	1,158,008	36,628	8,277,019	302,282	7,638,798	224,345
Fiber insulating lath or board ..... sq. ft.	5,531,899	188,390	3,967,642	119,234	28,188,932	902,604	17,348,186	552,903
Wall board of paper or pulp ..... sq. ft.	2,267,652	79,833	2,112,541	62,492	13,742,584	444,717	8,375,759	271,749
Blotting paper ..... lbs.	315,382	33,868	196,839	22,143	1,424,027	167,619	1,008,609	112,894
Filing folders, index cards, and other office forms ..... lbs.	157,216	73,998	103,371	39,082	725,457	274,311	659,443	208,645
Papeteries (fancy writing paper) ..... lbs.	37,916	8,501	34,937	8,340	249,379	54,033	130,919	32,978
Other writing paper ..... lbs.	2,032,081	226,397	1,136,807	125,247	9,637,212	1,004,516	6,248,482	626,679
Paper hangings (wall paper) ..... rolls	120,701	23,814	214,880	18,753	1,990,587	303,247	1,989,126	229,481
Paper bags ..... lbs.	828,586	75,529	1,047,659	79,472	3,969,386	348,014	5,315,484	384,130
Boxes and cartons ..... lbs.	2,559,485	125,408	1,371,881	88,470	11,080,586	620,644	6,019,834	403,691
Envelopes ..... lbs.	241,444	34,099	144,555	24,697	1,057,660	171,776	767,272	117,074
Vulcanized fiber sheets, strips, rods, and tubes ..... lbs.	362,832	87,303	199,414	58,525	2,063,084	509,017	1,340,217	343,311
Cash-register and adding-machine paper ..... lbs.	878,471	73,672	737,785	63,202	2,433,979	218,315	3,119,984	252,640
Other paper and paper products	.....	355,002	.....	281,651	.....	1,946,844	.....	1,454,083
WOOD PULP AND PAPER STOCK								
Sulphite wood pulp ..... tons	4,423	236,696	4,247	192,811	13,126	728,167	14,631	698,679
Soda wood pulp ..... tons	210	14,904	144	10,301	1,339	103,736	612	44,970
Other wood pulp ..... tons	424	16,998	236	10,220	4,199	168,760	768	28,118
Rags and other paper stock ..... lbs.	4,884,243	76,935	5,653,916	67,953	27,359,403	417,394	26,147,136	289,518
PAPER AND PULP MILL MACHINERY								
Paper and pulp mill machinery	.....	253,075	.....	123,926	.....	1,235,666	.....	637,403

To Reduce Oregon Printing Costs

PORTLAND, ORE., August 7, 1931—Rufus C. Holman, Portland, president of the Portland Paper Box Company, and state treasurer, has been making quite a campaign to reduce state printing costs having pointed out to Governor Meier in a recent letter that a $50,000 saving would result next year. Economies amounting to 36 per cent have already been made by the committee, the standardization of stationery throughout all the various departments accounting for considerable of this cost reduction.

In his letter to the governor, Mr. Holman also asked official recognition of services for those who have assisted him in the reorganization of state printing plant policies. Those cited for this acknowledgement are:

A. J. Rahn of Rahn & Whorter Paper Company, Salem; Andrew J. Lampert of the Zellerbach Paper Company, Portland; P. C. McDonald of the Rodgers Paper Company, Salem; Walter Huelat of Blake, Moffitt & Towne, Portland; W. P. McFall, Portland, and E. C. Hobbs, state printer.

Economies were effected through the adoption of proper paper for the purpose in hand. Weights and grades were given proper consideration, and the elimination of duplicate forms will hereafter be avoided. The reduction in the number of sizes used in forms and blanks will result in considerable cost there, it is said. All forms are hereafter to be purchased in the state.

Joseph Dilts Bennett Sails for Shanghai

FULTON, N. Y., August 8, 1931—Joseph Dilts Bennett, son of B. W. Bennett, vice-president of Dilts Machine Works, Fulton, sailed from San Francisco for Shanghai, China on July 24. Mr. Bennett is connected with the Texas Oil Company and recently returned from Texas for a visit at his home before taking up his new assignment.

1931 EDITION

PRICE $7.50

LOCKWOOD'S DIRECTORY of the PAPER & ALLIED TRADES

CORRECTED UP TO DATE

The 56th Consecutive Annual Edition

THE OLDEST INDUSTRIAL DIRECTORY IN THE UNITED STATES

CONTENTS

Entire contents classified under separate headings for the United States and Canada, alphabetically and geographically arranged by states.

City Addresses of Mills and Mill Supply Houses
Classified List of Paper Mill Products
Classified List of Pulp Mill Products
Coated Paper Manufacturers
Envelope Manufacturers
Glazed and Coated Paper Manufacturers
Idle Mills
Mill Officials
Pad Manufacturers
Paper Merchants
Paper Stock and Rag Dealers
Paper Bag Manufacturers
Paper Box Manufacturers
Paper, Wood Pulp and Chemical Fiber Mills of the United States, Canada, Cuba, Mexico and South America
Paper Specialties Manufacturers
Papeterie Manufacturers
Prepared Roofing Manufacturers
Rags and Paper Stock Consumed by the Paper Mills
Stationers in United States, Porto Rico, Canada, Cuba, Hawaiian Islands and the Philippine Islands
Statistical Table of Mills
Tablet Manufacturers
Tag Manufacturers
Toilet Paper Manufacturers
Trade Associations
Twine Manufacturers
Vegetable Parchment Manufacturers
Wall Paper Printers
Water Marks and Brands
Waxed Paper Manufacturers

1,000 PAGES *of* USEFUL INFORMATION

Special Traveler's Pocket Edition

bound in a flexible cover for use of traveling men, comprising the Paper and Pulp Mills, Coating Mills and the Mill Officials. Price $7.50, including delivery charges. ($7.00 cash with order.)

Published by

LOCKWOOD TRADE JOURNAL CO.

10 E. 39th St. ~ ~ NEW YORK, N. Y., ~ ~ U.S.A.

PAPER TRADE JOURNAL
ESTABLISHED 1872

Published at 34 North Crystal St., East Stroudsburg, Pa. Executive and Editorial Offices, 10 East 39th St., New York, N. Y.

Henry J. Berger
Editor

Ronald G. Macdonald
Editor Technical Section

Herbert J. Laughton
Associate Editor

Thomas J. Burke, C. A.
Editor Cost Section

Reginald Trautschold, M. E.,
Power Engineering Consultant

Lynne M. Lamm, *Washington Correspondent*

Price. Per Copy, 10 Cents United States, Per Annum, $4.00
Canada and Foreign Countries in Postal Union, $6.00

Member Audit Bureau of Circulations

Vol. XCIII New York, August 13, 1931 No. 7

PAPER WEEK IN FEBRUARY 1932

The American Paper and Pulp Association announces that Paper Week in 1932 has been set for the third week in February, beginning Monday, February 15.

The meeting will be held at the Hotel Pennsylvania, New York, which hotel has cared for the convention for the past two years in a manner that was eminently satisfactory to all of the interested groups.

SIGNS OF RECUPERATION

So much attention has been given to the European financial crisis of the last two months, says the American Bankers Association Journal, that certain definite signs of recuperation in the United States have passed almost unnoticed.

"A number of major industries have apparently emerged from their cycles of deep depression," the Journal says, "and are currently operating on larger volume than a year ago, among which might be mentioned the cotton, woolen, silk, shoe, and rubber industries, also chain stores and department store trade in some sections of the country.

"The seasonal slowing down that occurs during midsummer has further increased the slack in employment and plant capacity, but the Autumn months have never failed to bring a material expansion, save in the exceptional instances when the trend was sharply downward, as in the years 1930, 1923, 1914 and 1903.

"Adverse conditions have spurred drastic reduction in manufacturing, selling and overhead costs in almost every line. Recently published statements for the second quarter show that greater economy and efficiency are now being turned into increased earnings. Some of the more progressive corporations that were in the red during the first quarter have decided to take business as they find it, rather than to mark time and possibly go bankrupt waiting for the rest of the world to recover, and achieved a net profit after all charges during the second quarter. Possibly other companies will take the hint to lower their own costs likewise, so as to be in a position to move their product and, incidentally, disburse larger payrolls.

"So far there has been no concerted move toward reduction in wages, although in the first six months of this year 1,436 individual establishments reported a lowering of wage rates, and in 1930 there were 900 so reporting. Since November, 1929, there has been a total of 2,364 wage cuts reported in the monthly reviews of the Bureau of Labor, which almost coincides with the number of dividend reductions and omissions totaling 2,300 during the same period.

"Wage rates are ultimately determined, as are commodity prices and interest rates, by economic conditions, and they are constantly changing so as to maintain a natural equilibrium. Wage rates are not made by employers or workers, by labor unions, politicians, or any other individuals—they but discover and conform to them."

TRANSPARENT WRAPPING IN EUROPE

The varied uses and growing potentialities of transparent wrapping paper, as evidenced by the development of cellulose sheeting of this type, are attracting greater attention on the part of the European paper industry which is now developing a number of paper impregnating processes with the object of maximum transparency in view, according to a report received in the Commerce Department's Paper Division from Commercial Attache Marquard at Oslo.

Impregnation, as a paper converting process, has developed very rapidly in Europe during recent years, although it has by no means attained the importance and proportion that it has in the United States. The more common processes, such as waxing, oiling, and asphalting have been known for years but the use of such papers, compared to the American consumption is quite in its infancy in Europe. On the other hand, certain processes have been developed, notably in the manufacture of transparent papers, and are more extensively used than in the United States.

European trade leaders state that the advantages of transparency in wrapping materials have always been obvious, but never to such an extent as with the development of transparent cellulose sheeting. Because of the investment necessary in its manufacture, and possible patent infringement litigation, there have been comparatively few competitive developments, except in cheaper imitations. Some of these are gelatine, and others impregnating processes. Impregnating is the least expensive, of course, requiring comparatively simple equipment. The solutions used seem to have a varnish base, although the actual composition is the secret of the manufacturer, and analysis is difficult. There has been a gradual improvement in the quality of these types of paper, most of which are

produced from a tissue paper base, but the perfection of transparent cellulose sheeting has not been reached, according to European trade opinion. Much further research is necessary before this can be hoped for, the trade believes.

The vogue for transparent wrappings has also been taken up by vegetable parchment manufacturers. In Germany, so-called silver parchments have appeared on the market, while in Sweden one of the leading paper manufacturers has brought out a product apparently parchmentized to an unusual degree of transparency.

A parchmentized kraft paper was recently introduced on the market by a German manufacturer, which opens up another possibility for the use of kraft paper. The product is reported to be manufactured by a process similar to that used in the production of ordinary vegetable parchment papers, except that an unsized kraft paper is used instead of an unsized sulphite paper.

To Cut Production of Sulphite

WASHINGTON, D. C., August 12, 1931.—Commercial Attache T. O. Klath, at Stockholm reports that an agreement has been reached between sulphite wood pulp producers in Sweden, Finland, Norway, Germany, Czechoslovakia, Austria and the Baltic States whereby there is to be a further reduction in output retroactive as of July 1.

This agreement was made public by the Swedish Cellulose Association. Representatives of the sulphite wood pulp industry in the above countries in the fall of last year formed an organization known as the Association of Sulphite Pulp Suppliers, the purpose of which was to work for a stabilization of the sulphite market by mutual reduction of annual output.

It was at that time decided to cut down production by 15 per cent during the period from October 1, 1930 to December 31, 1931. This reduction having proved to be without sufficient effect, has now been increased by 15 per cent for the entire year 1932, and in addition, an extra 15 per cent during the period July 1, 1931 to June 30, 1932. This means that during the coming twelve months the total cut in output will be 30 per cent. The agreement affects a total production of 3,200,000 metric tons, dry weight.

TAPPI Notes

George H. McGregor, research chemist of the Northwest Paper Company, Cloquet, Minn. has been appointed a member of the instructing staff of the Institute of Paper Chemistry, Appleton, Wis.

H. N. Booker has resigned as vice president and general manager of the Hermann Machine Company, Lancaster, Ohio and has joined the Hocking Glass Company of Avondale, Ohio.

J. J. O'Connor, of the Mead Corporation, Chillicothe, Ohio, has been appointed chairman of the Finishing, Processing and Converting Committee of TAPPI to succeed Norman Clark of the Standard Paper Manufacturing Company, Richmond, Va., who has left the paper industry.

C. W. Morden of the Morden Machines Company, Portland, Oregon, and chairman of the Pacific Section of TAPPI is visiting in the East.

John I. Kelley, sales engineer, has been appointed representative of the Moore & White Company in the Technical Association.

Wide Interest in Oswegatchie Sale

[FROM OUR REGULAR CORRESPONDENT]

OGDENSBURG, N. Y., August 10, 1931—The coming sale of mill property of the Oswegatchie Paper Company at Natural Dam is bringing many inquiries to the referee, E. L. Wilcox, who is of the impression that a business boom is to be soon experienced by the paper industry in this section. Included in the sale to be held early in September will be several thousand acres of timberlands together with the paper mills and power plants in the villages of Natural Dam and Emoryville. The sale is to be conducted in the court house at Lowville and was brought about because of a foreclosure action against the paper company brought by the Watertown National Bank as trustee under two mortgages.

The company also controls the right of way for floating logs on the Oswegatchie River and its tributaries while its timberland holdings cover large tracts in the towns of Fowler, Gouverneur, Pitcairn, Diana, and Clifton in St. Lawrence and Lewis counties. The timberlands alone are considered to be of considerable value although no appraisal has been made. A considerable portion has been cut over during the past few years and there is said to be an acreage of reforested property.

The liabilities against the properties which it is hoped to cover by the sale amount to about $1,900,000. Included in this is $600,000 of the original bonds not surrendered when the second refunding mortgage and bonds were issued, representing some $900,000 of the amount. Upon these securities is due interest since February, 1928, while there are certain expenses increasing the liability to the amount stated.

Some of the inquiries already received by the referee request information regarding the nature and extent of all the property involved and both corporations and individuals are among the prospective bidders. Virtually all of the inquiries have come from large cities in New York and the New England States. Nearly all sought the information as to whether the properties are to be sold together or to be segregated. Announcement was made this week that the sale will be made in a single parcel, including lands, power sites and plants with all rights and privileges held by the company.

Tissue Co. Expands Plant at Camas

[FROM OUR REGULAR CORRESPONDENT]

PORTLAND, Ore., August 1, 1931.—The Tissue company of Saugerties, N. Y., which started manufacture in a leased building of the Crown-Willamette Paper company at Camas, Wash., a few months ago, has found such an increase in demand that application has been made to the Crown-Willamette Paper company for enlarged quarters for the converting plant.

Starting in a small space with one machine for making paper napkins the company is now operating a three-machine plant in the same quarters which are proving inadequate. The quarters applied for are in the southern section of the building where both storage and shipping facilities would be available. O. J. Leloff is superintendent.

S. Morgan Smith Co. Issues Catalog

S. Morgan Smith Company of York, Pa., manufacturers of hydraulic turbines exclusively, have just issued a new catalog (123A) regarding the Smith-Kaplan automatically adjustable blade turbine. Copy of this interesting and instructive catalog will be sent to those interested, upon application on your business letterhead.

YOU CAN CUT YOUR SIZING COST 30%

TODAY, more than ever, production costs must be decreased. Keen competition demands lower manufacturing costs. And these results can be obtained with the Delthirna system.

Definite evidence of the superiority of the DELTHIRNA SIZING PROCESS is shown in its use by over 177 leading paper mills. These mills are cutting their sizing cost 30% and more. You too can effect these savings. Why not let us furnish you with more information? Write us today.

DELTHIRNA

for full particulars write to

MANSFIELD, BOLTON & KENT
501 FIFTH AVENUE, NEW YORK

Sole Sales Agents For

AMERICAN DELTHIRNA CORPORATION

Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Hydration Of Wood Cellulose*

By Geo. H. McGregor[1]

Hydration, in the parlance of the paper maker, is the term which expresses the relationship between wood cellulose fibers and water. "Hydration" has been defined in many and various ways, all tending to indicate pulp quality. The term hydration when applied to control work in the refining of wood pulp usually is defined in terms of a unit of measurement that indicates the quality of a given pulp.

Among the many definitions of the term hydration, the following are cited from the more popular ones: J. E. Minor[2] says, "Hydration is the process of bringing into action the electrostatic affinities of the colloidal cellulose molecule by means of which the hydroxyl and hydrogen ions of water are absorbed causing the fiber to swell into a loose gel, thus giving the stock its characteristic slowness." J. W. Rowe[3] states that "Hydration is the amount of water or solution retained by the material after treatment in a centrifuge." James Strachan[4] says, "Hydration of fiber during beating may be defined as the increment of water imbibed during disintegration and fibrillation of the cellulose." Geo. Bidewell[5] says, "In everyday language hydration is defined as the gelatinizing of the fiber by taking on water. Hydrated fibers are gelatinous and swollen. They offer resistance to water passing through them and the more they are hydrated, the more resistance they offer. Hydration gives to a mixture of pulp and water characteristics similar to those possessed by a viscous fluid. The degree of hydration as measured by viscosity is a very important indication of the condition of the stock." An unknown writer says, "Hydration consists of the progressive gelatinization of the fiber wall, or the formation of a coating of colloidal cellulose on the surface of the fibers under action, with consequent loss of capillary power, by combining of fiber and water; this being controlled by length of time under treatment, condition of knife edges, consistence of stuff, and its chemical conditions."

A present day convenient measure of hydration is made by the so-called "freeness or slowness" tests. Each instrument used for the test yields a result which indicates the rate at which water either flows through or from pulp samples. Among the freeness testers in daily use in mill and laboratory may be mentioned the Green's Freeness Tester (which is no longer on the market), the Williams Freeness Tester, the Schopper Reigler Beating Tester, and others more or less popular among pulp and paper manufacturers.

Freeness, a so-called measure of hydration, is said to give (1) an indication of the behavior of pulp on the machine wire, (2) an estimate of length of fiber, (3) aid to obtain uniform beating, etc.

Hydrating machinery generally in use in the laboratory and mill includes laboratory and mill beaters, jordans, ball mills, rod mills, Lampen mills, Bahr mills, etc. Each of these develops the condition of cutting and fibrillation accompanied by hydration. In refining a pulp in each of the machines it is a well known fact that the strength test of a pulp increases to a certain maximum with increase in time of refining and thereafter decreases until the structure of the fiber is completely destroyed. In each instance it is claimed that the hydrating machine in question yields a stronger pulp with excellent qualities for the paper machine.

The question now arises, just what is the relationship between this water of hydration and the cellulose during refining, and does the freeness test give an adequate interpretation of this relationship? By establishing the fact whether or not cellulose and water forms a true hydrate we might be able to answer the first part of the question. Experience has demonstrated that a far better measure than the freeness test alone is necessary to answer conclusively the latter part of our question.

Strachan Work on Hydration

James Strachan[4] in his work on the hydration of cellulose determines the degree of hydration by weighing the water retained by the samples of a pulp at a standard pressure and temperature. He uses a miniature hydraulic press operating on 5 grams of air dry pulp drained in a level layer about 6.5 cc. in diameter. The pulp is pressed on a 40 mesh wire, supported by a perforated steel grid. Comparative results are obtained at a pressure of 25 pounds per square inch. The actual content of colloidal water as distinct from capillary water can only be worked out from graphs covering a range of pressures from 5-100 pounds per square inch. The pressure plate of the ram is covered by a thin sheet of rubber to take up slight inequalities in the samples. It is essential to have the sample in a layer of uniform thickness and pressing at standard temperature. With this form of apparatus it might be proven that the increment of imbibition due to fibrillation in beating of very wet stuff is approximately 100 per cent (or equal to the weight of the dry fiber), whereas normal wet beating is round about 40-50 per cent. By this method he claims to get an absolute assay of hydration. When the increment of water retained by such a series of samples taken from a beater at different intervals, is graphed against time, using a constant power load, he obtains a straight line over the major portion of the operation, providing that the hydration is not only proportional to increase of specific surface but also to horsepower hours of beating. In the beating operation, he says, "the increase of surface due to cutting up of the fibers into short lengths is trifling compared to that caused by actual disintegration of fiber surfaces into fibrillae." In the case of the latter, the velocity of imbibition is so high that we may regard it as taking place almost instantly, as they are broken loose from the organized structure of the fiber.

Beadle and Stevens[6] in discussing hydration in paper making processes state that when beaten stuff remains in the beating engine

* This article represents a portion of the work submitted for the Master of Science degree by the writer during the time he held the Northwest Paper Co. Fellowship at the University of Wisconsin.

[1] Assoc. Member TAPPI, in charge laboratory, Northwest Paper Co., Cloquet, Minn.

and stuff chests over the week-end, a marked change is noticed in the beaten stuff. The question now arises whether the change was due to changes in physical state or to hydration.

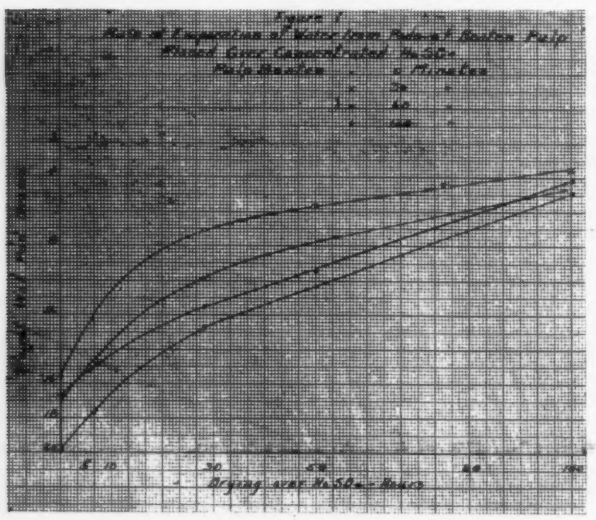
Sutermeister[7] determined the moisture content of sheets beaten different periods and does not find a progressive moisture content. A result which does not tend to strengthen the hydration theory. He says, "It is evident that any possible hydration is so slight that a moisture test cannot be used to throw any light on the amount of beating the stock has received."

McKay[8] contends that, "A piece of pure cotton put in distilled water for 48 hours will show an increase in the 'copper number' and the water has a decidedly alkaline reaction. This is the first step in chemical hydration. The increase in 'copper number' indicates the decomposition of the pulp. Control of hydration is obtained by forming a colloidal solution of cellulose and determining its viscosity which is a measure of its hydration."

J. W. Rowe[3] remarks that the term hydration cannot be used in the same sense as the hydration of a salt since the vapor pressure of water and cellulose shows no breaks. Several methods have been proposed for measuring the extent of hydration. In these, "hydration" is not definitely defined. Viscosity tests and volume of sediment of pulp are found unsatisfactory; increase in volume of the fiber is difficult to measure. The rate of drainage of water through pulp is influenced by viscosity and temperature of solutions and by traces of fatty acids. The amount of water or solution retained by the material after treatment in a centrifuge has been defined as hydration. Finally he gives a means of measuring the rate of evaporation of water from thin discs of unbeaten and beaten fibers. Evaporation is carried out in a dessicator over concentrated sulphuric acid at a constant temperature of 25 degrees Centigrade. Sharp breaks are found in the rate curves at certain percentages of water. These points seem to indicate a change in the forces effective in holding the water to the cellulose as the per cent of water is diminished. Using beaten pulp he shows that "hydration" increases with beating. Sharp breaks in the curve are explained in terms of a change similar to that from the crystalline to the amorphous state. When the beaten fibers were allowed to stand it was found that the hydration decreased. This would be explained by the tendency of the cellulose to revert to the crystalline state in which less water is retained. Rowe also states that X-Ray spectographs of beaten and unbeaten fibers failed to show a change in the structure of the cellulose.

Herzog, on the other hand, states that there is a structural change and that it is shown on X-Ray examination.

C. J. J. Fox[9] considers that the facts that cellulose hydration curves are unbroken (indicating a continuously variable vapor pressure consistent only with the presence of physically held water) and that lack of evidence of the existence of a definite vapor pressure (such as would be expected in the case of a true hydrate) favor the non-existence of a cellulose hydrate, but it is not conclusive proof.



No Evidence of Chemical Hydration

J. Strachan[10] concludes that during the dessication of cellulose under various conditions there is no evidence to show that it forms a chemical hydrate. In order to illustrate the velocity of imbibition of water by cellulose in the beating operation, experiments were conducted on blocks of vulcanized rag fibers, in which fiber structure has been very largely retained but interfiber space is eliminated. These experiments show that the velocity of imbibition (1) is represented by a logarithmic graph similar to that observed in the case of other elastic gels; (2) is increased by pressure, vacuum conditions and heat, and this increase is due to the removal, compression, and solution of absorbed gases such as air, resulting in increases in specific surface; (3) is directly proportional to the specific external surface of the mass, and to increase of surface due to swelling; (4) in saturated or air free specimens, is increased by pressure and cold, but diminished by heat; (5) is increased or retarded by various substances in dilute solution. Hydration of the fiber during heating is considered to be the increment of water imbibed during disintegration and fibrillation of the cellulose, and it may be measured by weighing the water retained by the samples at a standard pressure and temperature, the difference between the water of imbibition in the unbeaten pulp and that of the beaten pulp being the so-called water of hydration.

Freeness as a Measurement

Freeness of pulp is generally defined as the rate of drainage of water from the pulp on the machine wire. At present, "Freeness" is the most generally accepted test for the hydration of pulp. Although many claim that the test is sufficient to determine the quality of a given pulp, others claim that it is far from satisfactory, and that in order to secure a definite knowledge of hydration of wood pulp a test other than freeness has to be developed.

Instruments previously constructed to measure this flow of water through pulp may be divided into two general classes: (1) those depending upon the measurement of water delivered in a given length of time, or those depending on the total amount of water draining through the side orifice. (2) Those depending on the volume of fiber after the water is removed by drainage.

Probably the earliest type of "beating tester" is that of Klemm[11] wherein he suggests utilizing the softness of half-stuffs as a qualitative basis for comparing them, and in order to measure this so-called softness he constructed his sedimentation tester. This consists essentially of a glass cylinder with a machine wire bottom. If the water is allowed to drain away from a known weight of the stuff, the latter will occupy a certain volume in the glass cylinder. This volume provided a guide to the character of the pulp as the soft pulp will settle in a thinner, denser layer than one composed of hard fibers.

A short time later the Schopper Reigler Beating Tester[12] appeared. It consists of a chamber for holding the dilute pulp suspension, with a closing cone over the bottom; a perforated bottom to the chamber, and below the bottom a conical separating chamber provided with a large and a small discharge opening. The test is made by pouring 1.00 liter of 0.2 per cent stock into the top chamber, lifting the closing cone and collecting separately the water from the two discharge openings. The number of cubic centimeters of "quickly drained" water from the large opening is subtracted from 1,000 cc. and the remainder divided by 10 to secure the "beating" degree of the pulp.

Next A. B. Green developed the "Improved Paper Stuff Tester" which has been extensively used throughout the industry, and is fully described in [13].

Later, F. M. Williams developed three types of freeness testers, each one being an improvement on its predecessor. The first called the "Model 50-50 Freeness Tester," the second "Model B 1925 Tester," the latest being the "Model B 1927 Tester." Each tester is fully described in [14] and [15].

The Canadian Pulp and Paper Association uses a standardized

freeness tester which is essentially the Green's type of tester with the exception that it is more rigidly supported and is made of cast brass to allow accurate machine work and exact duplication. All instruments are calibrated by the Division of Pulp and Paper Forest Products Laboratories of Canada.

Thus we might define the property of freeness or slowness of pulp as being a measure of the rate of flow of water through it. Although it is claimed that each test appears to give an indication of the quality of a given pulp; that it is a measure of beating and refining; that it will tell the action of the pulp on the wire; the question still arises, is freeness an adequate indication of pulp hydration or fibrillation, or what is its real significance?

Experimental

The present experimental work consists in an attempt to determine by means of a few chemical tests, the action of water and cellulose during refining in a ball mill.

In the refining of pulp whether it be in the beater, jordan, ball mill, or rod mill, does the cellulose fiber and water combine to form a true cellulose hydrate or is the water held to the cellulose fiber by some great force such as adhesion, adsorption, etc.? If it is assumed that in the refining operation water is held bound by cellulose, then when solutions of salts are made up using the water in the cellulose as a solvent we would expect the solutions to be more concentrated than calculated, due to removal of the solvent. It is possible to determine this experimentally by a number of different methods, among which might be mentioned, freezing point depression, displacement, vapor pressure, heat of wetting, and others.

In the present procedure we attempt to establish the relationship between cellulose and water by means of displacement, freezing point, and rate of evaporation over concentrated sulphuric acid.

In the first instance water was displaced from samples of kraft pulp refined in the small ball mill (4 liter capacity) for different increments of time, usually 0, 15, 30, 45, 60, and 120 minutes. Pads of the refined pulp were made using a Buchner funnel, and a moisture test made on the pad. Then 150 cc of ethyl alcohol of predetermined concentration was added to 50 grams of wet pulp at 24 per cent consistence in a 250 cc Erlenmeyer flask, shaken for about one minute. The liquids were then separated from the pulp by means of a Buchner funnel. The concentration of the alcohol is again determined by means of the specific gravity test. If all the water in the pulp is free to act as a solvent, or a diluent as in this case, then the concentration of the final alcohol solution should correspond with that calculated, if the concentration of the original alcohol and the amount of water added with the refined pulp are known.

One factor which might tend to affect the results obtained by this method is the possibility of alcohol soluble material being extracted from the cellulose and tending to affect the specific gravity test. However the alcohol and cellulose were in contact for such a short period that practically nothing was extracted as was shown by evaporation of the alcohol which has been in contact with the pulp.

The results of this first experiment as shown in tables I and II seem to indicate that water is not held bound by the cellulose in the process of refining in the ball mill.

In the second experiment on pulp hydration we attempt to determine whether or not transition points occur in curves showing the rate of evaporation of water from pulp pads.

TABLE 1—KRAFT PULP

Pulp Beaten Minutes	Wet Pulp Grams	Bone Dry Pulp Grams	H_2O In Pulp Grams	94.5% Alcohol Added C. C.	Per cent Alcohol by Weight as Calculated	Per cent Alcohol by Weight from Experiment
15	50	12.2	37.8	150	70.7	70.50
	50	12.2	37.8	150	70.7	70.35
30	50	9.13	40.77	150	69.5	69.39
	50	9.13	40.77	150	69.5	69.10
45	50	10.15	39.85	150	69.9	69.77
	50	10.15	39.85	150	69.9	69.77
60	50	9.30	40.70	150	69.4	69.26
	50	9.30	40.70	150	69.4	69.24
120	50	10.85	39.15	150	70.2	69.95
	50	10.85	39.15	150	70.2	69.95

TABLE 2—KRAFT PULP

Pulp Beaten Minutes	Wet Pulp Grams	Bone Dry Pulp Grams	H_2O In Pulp	89.3% Alcohol Added	Per cent Alcohol by Weight as Calculated	Per cent Alcohol by Weight from Experiment
0	50	12.30	37.70	150	66.2	65.66
	50	12.30	37.70	150	66.2	65.36
15	50	13.37	36.63	150	66.7	64.5
	50	13.37	36.63	150	66.7	64.9
30	50	12.10	37.90	150	66.2	64.4
	50	12.10	37.90	150	66.2	64.4
45	50	11.05	38.95	150	65.75	64.1
	50	11.05	38.95	150	65.75	64.3
60	50	11.30	38.70	150	65.80	65.25
	50	11.30	38.70	150	65.80	64.76
120	50	10.85	39.15	150	65.7	64.62
	50	10.85	39.15	150	65.7	64.89

Kraft pulp beaten 0, 30, 60, and 120 minutes in the small ball mill was made into pads about ¼ in. thick and about 4 inches in diameter, and placed in dessicators over concentrated sulphuric acid. At different intervals the pads were removed from the dessicator and weighed. This continued until the pads lost the maximum water content after which they were placed in the oven to dry for 1 hour at 105 deg. C.

Results indicate that practically all the water is removed from the pulp in the dessicator in 100 hours. The curve secured by plotting weight of pad against time is similar for unbeaten and beaten stock and is devoid of transition points, which would be evident were the water chemically united to the cellulose. At the lower moisture contents the rate of removal of water decreased considerably, probably due to a greater exertion of that force tending to hold the water to the cellulose. Sulphuric acid removed all but .1 per cent water from the pulp pad.

The third set of experiments also tended to shed light on the possibility of cellulose and water forming a true hydrate. This consisted in a determination of the freezing point of a molar solution of sucrose.

As has been previously mentioned, if water is held bound by the cellulose in the process of refining then it will be prevented from playing the role of a solvent. In this case if we utilize the water in the cellulose in making up a molar solution of sucrose any bound water will not be available as a solvent and the concentration of the sucrose solution will be greatly increased as evidenced by a greater depression of the freezing point. On the other hand, if the water is entirely available the freezing point of the sucrose solution will be unaltered.

In this case the relative freezing points of molar solutions of sucrose were determined, and not the absolute values. A molar solution of sucrose was prepared by adding sufficient wet pulp of about 2 or 3 per cent consistence to a molar solution of sucrose. The relative freezing point of this suspension was determined and compared with that of the molar solution previously prepared but with the pulp omitted. Numerical results are recorded in table III.

In this first experiment it was decided that the consistence of the pulp was too low, allowing for very little combined water, if any. A 2 molar solution of sucrose was prepared and diluted to 1 molar concentration by the addition of sufficient wet refined pulp so that the water in the latter diluted the sucrose to 1 molar concentration. This suspension was allowed to stand for two or three minutes, the liquids then being removed from the pulp by means of the Buchner funnel. The relative freezing point of the liquid was then determined and compared with that of the molar solution free of pulp.

In each instance, table III and IV, the relative freezing points of the molar solution of sucrose prepared with water alone, and those of the molar solution in which the water in the pulp was used as a solvent or diluent, are quite similar and within the range of experimental error. These results tend to further show that in the refining of cellulose the water is not held bound and that cellulose and water do not form a true chemical hydrate.

These results that have been obtained tend to substantiate those of others which show that cellulose and water do not form a true hydrate in the refining operation.

These results of displacement, vapor pressure, and freezing

point have been determined on a single pulp, treated in a single refining engine. The displacement method probably yields a few questionable results which might require more thorough investigation. Parker[17], Keen[18], Bouyoucos and McCool[19] and others have done considerable work on the relationship between soil and water. It appears that their problem is somewhat analogous to that of cellulose and water and the conclusions might apply to refined cellulose and water.

TABLE 3—KRAFT PULP

Pulp Beaten Minutes	Wet Pulp Grams	Bone Dry Pulp Grams	H_2O In Pulp Grams	Total Liquids C. C.	Relative Freezing Point of Molar Soln. of Sucrose Using Pulp	Relative Freezing Point of Molar Soln. of Sucrose Free of Pulp
0	25	5.92	19.08	150	4.02 4.01	4.04
60	25	5.52	19.48	150	4.03 4.025	4.04
120	25	5.27	19.73	150	4.02 4.03	4.05

TABLE 4—KRAFT PULP

Pulp Beaten Minutes	Bone Dry Weight Pulp Grams	Consistence of Pulp Suspension in Sucrose	Super-cooled to	Freezing Point of Molar Soln. Sucrose Free of Pulp	Super-cooled to	Freezing Point of Molar Sucrose Soln. Using Pulp
0	30.77	15.3	2.84	4.05	2.39	4.023
30	30.13	15.0	2.84	4.05	2.69	4.033
60	31.53	15.7	3.1	4.043	3.23	4.083
90	30.59	15.7	3.1	4.043	3.16	4.084
120	37.15	18.5	3.1	4.043	3.51	4.323
120	30.40	15.2	3.1	4.043	3.16	4.036
120	30.23	15.2	3.1	4.043	3.43	4.04

A study has been made of the paper making term "hydration." The term "hydration" has assumed a vastly complex meaning as evidenced by the various definitions given at the beginning of this paper. Evidence has been presented that hydration is the imbibition of water and is measured by vapor pressure methods, centrifuge methods, heat of wetting methods, etc. An additional theory of the relationship between water and cellulose is that which states that possibly part of the water in the cellulose is held bound in the process of refining. The foregoing results tend to show that the water in the cellulose is not held bound, for it is possible to completely displace the water from cellulose by means of concentrated ethyl alcohol, in addition the concentration of molar solutions of sucrose are not increased as is evidenced by a failure to secure noticeable differences in relative freezing points of these solutions. Studies on the rate of evaporation of water from cellulose do not indicate the presence of different forms of cellulose water. The results might be explained as follows. At moisture contents below the water holding capacity of the cellulose, the water is held to the cellulose by an attractive force commonly called adhesion. As the moisture content of the cellulose gradually decreased the force with which the remaining water is held continually increases. This might cause an increase in the freezing point depression of cellulose water, a decrease in the rate of evaporation, and a decrease in the vapor pressure of cellulose water as the moisture content is reduced. This force might be great enough to prevent part of the cellulose water from being frozen at very low temperatures. The results that have been obtained tend to show that the cellulose does not render part of the water inactive during the process of refinement. The water must therefore remain in the liquid state and does not become combined with any of the material in the cellulose. There must, however, be a very great force holding the water to the cellulose. This force is probably best shown by means of vapor pressure methods. Vapor pressure curves of pulp refined in the various refining engines might throw considerable light on the relationship of cellulose, water, and strength developed.

References

[2] Minor, J. E. Colloidal Properties of Cellulose. Paper, Vol. 25, No. 1, 22-25.
[3] Rowe, J. W. The Effect on Cellulose Fibers of Treatment in the Paper Maker's Beater. Paper Makers Monthly Journal, Vol. 66, No. 1, 22-25.
[4] Strachan, James. Hydration of Cellulose in Paper Making. Paper Industry, Vol. 8, No. 2, 235-237.
[5] Bidewell, Geo. L. Hydration Machinery for the Paper Mill. T. A. P., Series V, 7-8.
[6] Beadle, C., & Stevens, H. P. Hydration in Paper Making Processes. Paper, Vol. XI, 5, 19.
[7] Sutermeister, E. A. Beating Test for Paper Making Fibers. Paper, Vol. 17, Sect. 9, p. 11.
[8] McKay, A. Chemical Hydration of Pulp. Paper, Vol. 29, No. 16, 7-10.
[9] Fox, C. J. J. Hydration of Cellulose. Chemical Abstracts, 20, 2069.
[10] Strachan, James. Hydration of Cellulose in Paper Making. Chemical Abstracts, 20, 2068.
[11] Wochenblatt fuer Papierfabrikation, 1907, p. 3882, 3986.
[12] Wochenblatt fuer Papierfabrikation, Sept. 27, 1913.
[13] Green, A. B. Freeness Tester. Paper, Feb. 23, 1916.
[14] Williams, F. M. A New Freeness Tester. Technical Association Papers, Series X, 41-43.
[15] Journal of Industrial and Engineering Chemistry, Vol. 18, 631, 1926.
[16] Keen, B. A. The Evaporation of Water from Soil. Journal of Agriculture Science, Vol. 6, pt. 4, 456-475.
[17] Parker, F. W. Classification of Soil Moisture. Soil Science, Vol. 13, No. 1, p. 43.
[18] Keen, B. A. A Quantitative Relation Between the Soil and the Soil Solution Brought Out by the Freezing Point Determination. Journal of Agriculture Science, Vol. 9, 400-415.

The Volumetric Composition of Paper*

By P. S. Billington[1] and C. E. Hrubesky[2]

The apparatus for the determination of the solid fraction of papers has been improved, and the applicability of the method has been tested. The papers used in the study were several commercial type, and some laboratory samples made from stuffs processed by beating and wet pressing.

A method of procedure for simple papers is outlined.

In a previous article[3] a tentative method for determining the volumetric composition of paper, including the solid fraction by procedure of Washburn and Bunting[4] using a modification of Pressler's apparatus,[5] was based upon the drop in pressure of a definite volume of gas when that gas is allowed to expand into a partially evacuated cylinder containing the paper sample.

The present report covers a modification of the previous apparatus to facilitate manipulation, an improvement in the method of procedure, and a compilation of data on the solid fraction of a number of simple papers as well as a few papers of a more complex character.

By "simple" papers is meant papers composed only of the essential fibrous materials. In contrast, "complex" papers contain such nonfibrous (or noncellulosic) materials as the fillers, size, coating, and water-proofing agents, oils and varnishes, for example.

As pointed out in the first article,[3] the volumetric composition of paper comprises the volumes of air, liquid, and solid fraction. In simple papers, such as pulp test sheets, the total air fraction consists of the pore and recess volumes, the void volume being negligible. The solid fraction is composed of fibers only; the liquid fraction, that is, the moisture content, may be considered as a part of the solid fraction in simple papers, in which no filler, size, or similar material is present.

Fig. 1 shows the modified apparatus used in the experimental work. It consists essentially of a reservoir V^1 of accurately known volume, which can either be evacuated or allowed to come to

---

* Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, Feb. 17-19, 1931.
[1] Junior chemist, Forest Products Laboratory, Madison, Wis.
[2] Assistant chemist, Forest Products Laboratory, Madison, Wis.
[3] Baird and Hrubesky. Determination of the Volumetric Composition of Paper. Paper Trade Jour., July 24, 1930.
[4] Washburn and Bunting. Jour. Amer. Ceramic Soc. V (8): 535-7 (1922).
[5] E. E. Pressler. Jour. Amer. Ceramic Soc. VII (3): 154-9 (1924).

atmospheric pressure by manipulation of a three-way stopcock (not shown), and cylinder V, also of determined volume, which is connected directly to a mercury manometer E and also to V_1 through stopcock C; it can also be connected to a vacuum line through C, D, and the 3-way stopcock. Cylinder V_1 is closed by a vacuum-tight cap B bolted over a lead gasket. Cylinder V is closed by a cap A seating on a lead gasket, a cam clamp G holding it in place. In the actual apparatus, V_1 had a volume of 48.6 cc., V a volume of 199.7 cc., and the manometer column was of sufficient length to measure pressures ranging from 0 mm. to 760 mm. in increments of 0.5 mm.

In addition to the preceding are several solid brass cylinders V_R; 8 inches in length but of different diameters and volumes. These rods are used to decrease the effective volume of V and thus increase the accuracy of the apparatus for small test samples. Four such rods having volumes of 102.1 cc., 128.9 cc., 159.4 cc. and 176.2 cc., respectively, were included with the present apparatus.

Calibration of the Apparatus

The cross-sectional area of the manometer was first determined by filling the tube with water from a burette, making height measurements on the water column with each 1 cc. addition. A fairly uniform cross-sectional area of 0.368 sq. cm. was found. Thus the volume of the manometer above the mercury could be easily determined in the experimental work and the volume of V then corrected by the proper amount. All connecting tubing above stopcock D is capillary.

The calibration of the apparatus was carried out as follows: The system was brought to the lowest pressure possible with the evacuating apparatus, stopcock D was closed, and the pressure determined. Stopcock C was then closed and D and the 3-way stopcock opened, allowing the pressure in V_1 to equalize with the atmosphere. D was then closed and C opened and the pressure in the system again determined. A rod of known volume V_R was then inserted in V and the procedure was repeated.

For convenience in calculation, let

V_1 = volume of the air reservoir

V = volume of the test cylinder.

V_R = volume of a rod.

H = barometric pressure.

P_O = pressure in V before expansion from V_1; without a rod.

P_T = pressure in the system after expansion from V_1; without a rod.

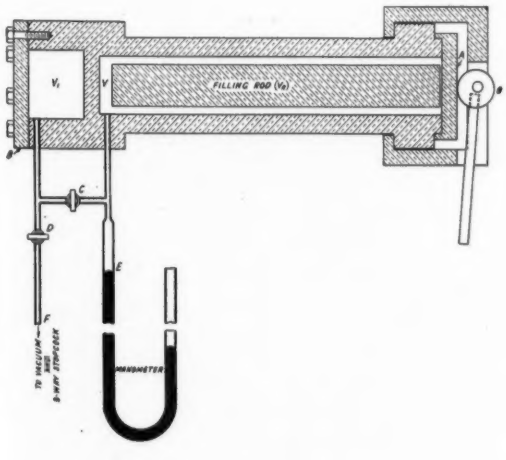


FIG. 1.
Apparatus for determining the solid fraction of paper by volume.

P_S = pressure in the system before expansion from V_1; with a rod in place.

P_R = pressure in the system after expansion from V_1; with a rod in place.

V_V = volume of the manometer above the mercury at P_O.

V_W = volume of the manometer above the mercury at P_T.

V_X = volume of the manometer above the mercury at P_S.

V_Y = volume of the manometer above the mercury at P_R.

When there was no rod in V, application of Boyle's Law gave the following relationship:

$$V_1H + VP_O + V_VP_O = V_1P_T + VP_T + V_WP_T \quad (1)$$

or

$$\text{or } V_1 = \frac{VP_T - VP_O + V_WP_T - V_VP_O}{H - P_T} \quad (2)$$

When a rod was placed in V, the following relationship could be deduced:

$$V_1H + VP_S - V_RP_S + V_XP_S = V_1P_R + VP_R - V_RP_R + V_YP_R \quad (3)$$

or

$$V_1 = \frac{VP_R - VP_S - V_RP_R + V_RP_S + V_YP_R - V_XP_S}{H - P_R} \quad (4)$$

Equating (2) and (4) and solving for V yields the following equation:

$$V = \frac{V_R(H-P_T)(P_S-P_R)+(V_VP_O-V_WP_T)(H-P_R)+(V_XP_S-V_YP_R)(P_T-H)}{(H-P_R)\ (P_T-P_O)+(P_T-H)\ (P_R-P_S)} \quad (5)$$

Experimental values may be obtained and substituted in (5). Values of V thus obtained may be substituted in (2) and V_1 determined.

Using this method and different values of V_R, several determinations of V and V_1 were made, none of which were more than 0.2 cc. from the average of 199.7 cc. for V and 48.6 cc. for V_1

Method of Determining the Solid Fraction of Papers

The sheets composing the sample were conditioned at standard relative humidity and temperature and were then cut to 7 by 9 inches (±1/32 in.). As many sheets as possible were used, five being the minimum unless the total quantity of the sample did not permit this number. The sheets were carefully measured to 0.1 mm. in each direction, with at least three measurements for each average. The thickness of the sheets was determined to 0.0001 inch by means of a caliper, with not less than four measurements (six is recommended) on each sheet. The number of sheets to be measured and calipered depended on the uniformity of thickness in the sample. The product of the average length, width, thickness, and number of sheets used gave the bulk volume of the test sample.

This sample was then wrapped around one of the rods, the particular rod chosen depending on the bulk volume of the sample, and was inserted in cylinder V to give a fairly snug fit, although a tight fit was avoided. If more than 75 cc. measured volume of paper was used the rod was omitted. Test cylinder V was closed and the system evacuated to about 20 mm. of pressure, which was recorded. Stopcock C was then closed and reservoir V_1 allowed to come to atmospheric pressure. Stopcock C was reopened, the gas in V_1 was allowed to expand throughout the entire system above D and the resulting pressure was determined. In order to obtain a check run V_1 was again allowed to attain atmospheric pressure and this gas was also permitted to expand, with a further pressure drop resulting. Thus two determinations were made, using a low and medium initial pressure.

In deriving the necessary formula, in addition to the preceding notation, let

V_S = solid volume of the sample.

V_B = bulk volume of the sample.

SF = solid fraction in per cent.

From consideration of Boyle's Law it follows that

$$V_1H + VP_S - V_SP_S - V_RP_S + V_XP_S = V_1P_R + VP_R - V_SP_R + V_YP_R \quad (6)$$

from which

$$V_B = \frac{P_B(V_Y + V) - P_S(V_X + V) - V_1(H - P_B)}{P_B - P_S} - V_B \quad (7)$$

$$SF = \frac{100}{V_B}\left(\frac{P_B(V_Y + V) - P_S(V_X + V) - V_1(H - P_B)}{P_B - P_S} - V_B\right) \quad (8)$$

The procedure just outlined was applied to a variety of papers, including specially prepared sulphite sheets (typical sample papers), and also to a number of representative grades of paper, a part of which had been made at this Laboratory and a part obtained from commercial sources

The sulphite papers were prepared from two digestions specially made under known conditions. In the first instance a quantity of easy-bleaching spruce sulphite pulp, digestion No. 3376, was beaten for 4 hours; samples were taken at 30-minute intervals, made into test sheets, and pressed in wet condition under different pressures. A second pulp, also easy-bleaching spruce sulphite (digestion No. 3377), was beaten 210 minutes without the taking of samples, and was otherwise treated in the same way.

The results obtained in determining the solid fraction of the Laboratory-made sulphite test sheets are set forth in Table 1. The solid-fraction determinations for 25 different types of papers are shown in Table 2. The data compiled in the paper tests were of especial value in demonstrating the range of applicability of the method.

Certain of the data from Table 1 have been plotted in Fig. 2, where the relation between solid fraction and beating time for sheets made under 2, 100, and 500 pounds per square inch wet pressure, respectively, is shown. In each group regular changes in solid fraction increases with time of beating, (2) for any degree these curves show that: (1) for any given wet pressure the solid fraction increases with time of beating, (2) for any degree of beating the solid fraction is greater for the sheet made by the greater wet pressure, and (3) the rate of increase of solid fraction increases as beating proceeds.

TABLE 1

THE SOLID FRACTION OF VARIOUS SHEETS

Beating time Minutes	Wet pressure Pounds per sq. in.	Sheets used Number	Bulk volume V B CC.	Solid fraction SF Per cent
	White Spruce Sulphite, Digestion No. 3376			
30	2	5	22.55	25.3
	50	5	14.03	39.2
	100	5	12.19	42.7
	500	5	11.28	49.6
	1500	5	11.07	47.6
60	2	5	17.47	32.0
	50	5	12.79	47.4
	100	5	12.30	46.2
	500	5	10.92	54.5
	1500	5	10.81	55.0
90	2	5	15.36	37.9
	35	5	12.96	44.9
	100	4	9.28	47.4
	500	5	10.80	50.7
	1500	5	10.10	54.7
120	2	5	14.52	43.7
	20	5	13.34	47.0
	100	5	11.61	51.0
	250	5	11.16	55.2
	750	5	10.80	56.8
150	2	5	11.11	56.6
	20	5	10.03	61.5
	100	5	9.48	63.9
	250	5	9.37	63.4
	500	5	9.06	65.7
180	2	5	10.00	73.3
	10	5	10.02	73.9
	100	5	9.58	67.6
	White Spruce Sulphite, Digestion No. 3377			
210	2	5	35.79	12.2
	5	5	33.09	14.3
	10	5	28.22	18.3
	20	5	21.94	26.0
	40	5	19.22	28.3
	70	5	17.52	27.4
	120	5	15.87	29.6
	200	5	14.97	33.7
	300	5	13.60	36.4
	450	5	13.97	40.9
	700	5	13.28	39.7
	1100	5	13.21	39.4
	1500	5	12.74	39.4
	2000	5	11.87	41.0

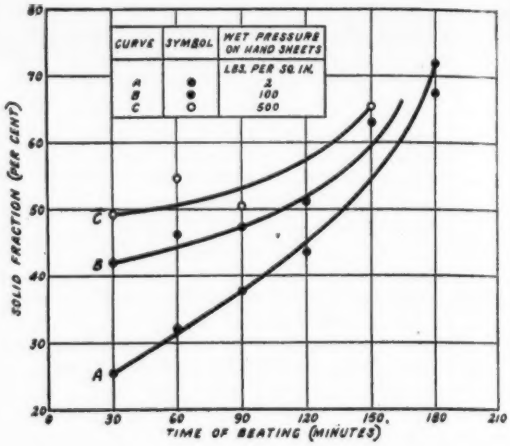


FIG. 2.

The effect of beating and wet pressure on solid fraction.

From a consideration of the results of several hundred determinations the limit of error in determining the solid volume (V_S) is estimated at about 0.7 cc. If the volume of the sample is fairly large this error does not produce a large variation in the solid fraction (SF). Thus, if the bulk volume (V_B) is found to be 55.63 cc. and the solid volume 23.0 and 23.7 on check determinations, the solid fraction will be 41.2 per cent and 42.6 per cent respectively, or a total variation of 1.4 per cent. If the bulk volume is small the error may become very large.

TABLE 2

SOLID FRACTIONS OF PAPER SAMPLES

Grade of paper	Ream weight 24x36—500 Pounds	Solid fraction Per cent
Mimeograph stencil pad	5.7	16.0
Filter paper	45.7	17.1
All ground-wood sheet	71.8	30.5
Yankee tissue	11.7	32.8
Cotton linters sheet	46.2	38.4
Semi-kraft heavy wrapping	69.9	37.1
Semi-kraft heavy wrapping, rod milled	46.5	42.2
New Zealand hardwood, news print	33.0	39.3
Hardwood news print, printed	33.1	46.6
Standard news print	32.6	41.3
Standard news print, printed	32.0	40.2
Bleached kraft book	43.3	46.1
Bleached kraft and soda book	68.5	47.9
Onion skin, Sample 1	21.2	45.1
Onion skin, Sample 2	20.1	48.7
Onion skin, Sample 3	20.4	53.3
Sulphite writing	46.0	53.5
Sulphite manifold	39.9	54.5
Kraft greaseproof, Sample 1	34.0	53.7
Kraft greaseproof, Sample 2	43.5	56.0
Bleached sulphite greaseproof	40.2	62.8
Bond	45.4	57.0
Water-finished butchers' fiber	55.8	56.3
Water-finished fiber	31.7	75.8
Glassine	25.0	83.5

An illustration of this point was brought out in an actual determination. The bulk volume of the sample was measured as 1.374 cc. The solid volume, in two determinations, was found to be 0.478 cc. and 0.298 cc. Although these two values are well within the estimated limit of error of 0.7 cc., the calculated solid fractions are 34.81 per cent and 21.72 per cent, respectively, which show a gross error of 13.09 per cent solid fraction. Making several check determinations and averaging the results should give a value close to the true value.

Another source of error is in the determination of the bulk volume V_B. Table 3, illustrative of this point, shows the apparent variation in V_B when measured by four different observers.

Several apparent errors in the solid fraction of pulp sheets are obvious in Table 1. The only explanation available at present is that these discrepancies are due to errors in determination of the bulk volume, experimental manipulation, or both.

TABLE 3

EXPERIMENTAL VARIATIONS IN V_B

Observer	Bulk volume in cubic centimeters Sample A	Sample B	Sample C	Sample D
1	13.20	36.41	26.96	39.08
2	13.29	35.11	27.00	35.67
3	13.74	33.68	26.96	....
4	....	37.61	25.75	37.39

Fiber Substance Density of Pulps and Papers*

By P. S. Billington [1a] and E. L. Keller [1b]

Summary

A study has been made at the Forest Products Laboratory of the density of fiber substances from various cellulosic sources, such as woods, pulps, and papers. The method selected for the determination was pycnometric, using a nonpolar hydrocarbon oil.

Tabulations of values in the literature as well as those determined are given; in general, the values are about 1.45 for woods, 1.53 for pulps, and 1.54 to 1.60 for papers, which are not in close agreement with some of the earlier values in the literature but check closely those of recent workers.

Introduction

In this report data are presented on the density of various woods, pulps, and papers, based on a pycnometric method of determination in which a hydrocarbon (mineral) oil of nonpolar character was used as the displacement medium. The method was selected with the object of obtaining a relatively high degree of accuracy, the data being needed in connection with various fiber-property investigations in progress at the Forest Products Laboratory and particularly in the development of a method for determining the volumetric composition of papers.

In selecting a method for determining density, a study of the literature was made and a summary of the references consulted is presented. The density of wood substance (cellulose and lignin) and of cellulose from various plants, other than wood, has been determined by numerous workers and a comparison of values from various sources is made with the data obtained here.

* Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., Feb. 17-19, 1931.

[1a] Assoc. Member TAPPI Junior Chemist, Forest Products Laboratory, Madison, Wis.

[1b] Junior Member TAPPI Junior Chemist, Forest Products Laboratory, Madison, Wis.

Literature Review

DeMosenthal (*3*)[2] determined pycnometrically the density of cotton, wood cellulose, ramie, and flax, using water as the displacement medium. He reports the following values: Cotton 1.607; Wood cellulose 1.575; Ramie 1.570 and Flax 1.548. He also cites three previous determinations on "cellulose" as 1.525, 1.5, and 1.25 to 1.45.

Sachs (*13*) determined the density of wood substance by weighing thin wood sections both in air and in water-alcohol mixtures of known density. He also ascertained the densities of calcium nitrate and zinc nitrate solutions in which the wood sections were in approximate equilibrium. With aqueous calcium nitrate solutions he obtained 1.5 for pine, and with alcoholic calcium nitrate solutions 1.523. Water and zinc nitrate gave 1.54. Hartig (*5*) and Dunlap (*4*), using the equilibrium method in salt solutions obtained values ranging from 1.4990 to 1.5639 for different specimens of wood.

Richter (*12*), using the pycnometric method with alcohol as the displacement medium, found the densities of black spruce heartwood and sapwood substance to be 1.512 and 1.516, respectively, whereas those of white spruce were 1.517 and 1.528. He also obtained values of 1.584 for cotton cellulose, and 1.583 for the fiber substance of filter paper.

Lewis (*9*) found the density of cotton cellulose in water to be 1.593 to 1.607, and in toluene to be 1.560 to 1.583. As the temperature of the water was increased from 20° to 50° C. a linear decrease in the density values occurred.

Davidson (*2*) determined pycnometrically the density of soda-boiled cotton. Water, as the displacement medium, gave 1.612 and

[2] Italic numbers in parentheses refer to "Literature Cited" given at the end of this report.

TABLE 1.—REPORTED VALUES FOR THE DENSITY OF WOOD AND FIBER SUBSTANCE

Substance	Displacement medium	Method	Density	Observer
Cotton	Water	Pycnometer	1.607	DeMosenthal
Wood cellulose	do	do	1.575	do
Ramie	do	do	1.570	do
Flax	do	do	1.548	do
"Cellulose"	Not stated	Not stated	1.525	Chemiker Kalendar
Do	do	do	1.5	Cross and Bevan
Do	do	do	1.25-1.45	Watt's Dictionary
Pine	$Ca(NO_3)_2$ and water	Equilibrium	1.5	Sachs
Do	$Ca(NO_3)_2$ and alcohol	do	1.523	do
Do	$Zn(NO_3)_2$ and water	do	1.54	do
Black spruce:				
Heartwood	Alcohol	Pycnometer	1.512	Richter
Sapwood	do	do	1.516	do
White spruce:				
Heartwood	do	do	1.517	do
Sapwood	do	do	1.528	do
Cotton cellulose	do	do	1.584	do
Filter paper	do	do	1.583	do
Cotton cellulose	Water	do	1.593-1.607	Lewis
Do	Toluene	do	1.560-1.582	do
Cotton, soda boiled	Water	do	1.612	Davidson
Do	Helium	Gas displacement	1.567	do
Alaska cedar	Water	Pycnometer	1.545-1.551	Stamm
Sitka spruce	do	do	1.527-1.530	do
Alaska cedar	Hydrocarbon oil	do	1.460	do
Do	Water	do	1.548	do
Cellulose:				
Cotton, sterile, absorbent	Water	do	1.598	do
Cotton, benzene washed	do	do	1.600	do
Cotton, alcohol washed	do	do	1.594	do
Cotton, sterile, absorbed	Benzene	do	1.574	do
Do	Carbon bisulphide	do	1.576	do
Do	Chloroform	do	1.577	do
Do	Propyl alcohol	do	1.583	do
Do	Absolute ethyl alcohol	do	1.590	do
Wood cellulose (Cross & Bevan):				
Catalpa heartwood	Water	do	1.594	do
Do	Benzene	do	1.571	do
Cotton linters, alpha-cellulose	Cuprammonium solution	do	1.569-1.550	do
Lignin, insoluble in 72 per cent H_2SO_4:				
Western yellow pine heartwood	Water	do	1.451	do
Western yellow pine heartwood	Benzene	do	1.436	do
Sitka spruce	Helium	Gas displacement	1.522	do
Do	Hydrogen	do	1.533	do
Do	Nitrogen	do	1.570	do
Do	Oxygen	do	1.626	do
Cotton cellulose	Not stated	Not stated	1.602±.004	Krüger [3]
Mercerized cellulose	do	do	1.571±.004	do

TABLE 2
THE DENSITY OF FIBER SUBSTANCE

Description of sample	Density
Alpha-cellulose from sterile absorbent cotton	1.539
Sulphite pulp, unbeaten	1.532
Pebble milled [1] 20 minutes	1.530
Pebble milled 40 minutes	1.525
Pebble milled 60 minutes	1.522
Pebble milled 80 minutes	1.530
Kraft pulp, unbeaten	1.530
Ground wood:	
50 per cent western hemlock, 50 per cent Sitka spruce	1.456
50 per cent white spruce, 50 per cent white fir	1.453
Sitka spruce	1.459
Western hemlock	1.456
Commercial papers: [1]	
Glassine	1.523
Yankee tissue	1.545
Bleached kraft book	1.621
Bond	1.469
Sulphite writing	1.528
Ground wood news print	1.487
New Zealand hardwood news print	1.513
Onion skin	1.530
Kraft greaseproof—rod milled	1.535
Cotton linters	1.582
Filter paper	1.545

[1] Uncorrected for ash content.

six different nonpolar organic liquids gave values ranging from 1.550 to 1.558. Helium gas displacement gave 1.567. Cotton from different sources, soda boiled and mercerized, viscose, cuprammonium, and nitro-celluloses all gave practically the same densities for each particular displacement medium.

Stamm (*14*) determined the densities of wood substances pycnometrically using water, as well as various organic liquids of differing polarity; also by gaseous displacement using various gases. With water, the density of Alaska cedar was determined as 1.545 to 1.551, while the values for Sitka spruce ranged from 1.527 to 1.530. With organic liquids, the density values of Alaska cedar increased from 1.460 in hydrocarbon oil (the most nonpolar liquid) to 1.547 in 95 per cent ethyl alcohol (the least nonpolar liquid). The densities were independent of the viscosity and density of the displacement medium. In helium the density of Sitka spruce was 1.522. The adsorption of helium is assumed to be negligible at room temperatures by Howard and Hulett (*7*).

Stamm (*15*) also determined the density of cotton linters alpha-cellulose by dissolving in cuprammonium solutions of different concentrations. His values ranged from 1.550 to 1.569.

Nave (*11*) suggests a method for specific gravity determinations of such porous substances as bricks. The sample is weighed in air, covered with a thin film of wax whose density is known, and weighed submerged in water. He reports very good results but obviously this method is not applicable to fibers.

Stamm presents data to show conclusively that the density of wood substance increases markedly with increasing polarity of the displacement medium. The following quotation is taken from Stamm: "Whether the differences in density are due to differences in penetration, in adsorption compression, or to both is a difficult question to answer. The same problem has arisen in the studies of the density of charcoal. Cude and Hulett (*1*) attribute such differences to differences in penetration, whereas Williams (*16*) and Harkins and Ewing (*6*) have evidence in favor of the adsorption-compression view. The latter investigators calculate from their data adsorption-compression pressures of 10,000 atmospheres and greater. Lowry (*10*), on the other hand, shows no partiality to either of these views, believing that with the proper technique very similar values can be obtained with quite different displacement liquids."

Stamm also shows the effects of differing concentrations of aqueous solutions of glycerine, glucose, acetic acid, sodium chloride, hydrochloric acid, barium chloride, sulphuric acid, potassium phosphate, and potassium hydroxide on the density of Alaska cedar wood substance. He finds that in all cases there is a decided drop in density with an increase in concentration. By plotting the density against the concentration in moles per liter, definitely parabolic curves are produced in every case. The nonelectrolytes, glucose and glycerine, depress the density to the same extent. Acetic acid shows a similar depression. Sodium chloride gives the same depression with about half as great a molal concentration, barium chloride does it for about one-third the concentration, and potassium phosphate for one-fourth. Stamm generalizes that the relative depression of the density is proportional to the ionic and molecular concentration of the solution used for displacement. The strong alkalies are an exception, depressing the density to a far greater extent than would be expected. On determining the adsorption values of salts by wood he is able to state that the decrease in the density of wood substances with an increase in concentration of the solute must be due to a decrease in surface adsorption-compression of the negatively adsorbed water, and a decrease in penetration of the solution. The abnormal effect of strong alkalies is shown to be due to permanent reduction of the density of the wood substance caused by chemical action.

Table 1 contains a summary of density determinations found in the literature on various wood substances and celluloses.

Procedure and Material

In view of the results obtained by the various workers, the procedure selected was as follows: samples of the pulp, paper, or other cellulosic materials were cut into thin strips and placed in a tared 50 cc. pycnometer. They were dried by placing in a vacuum oven at 105 deg. C. and 10 cm. pressure for 24 hours or more. The pycnometer was then closed and cooled in a desiccator. It was weighed and the material immediately covered with the oil of previously determined density. The pycnometer, sample, and oil were replaced in the vacuum oven at 90 deg. C. and 10 cm. pressure for from four to six days and after cooling and filling with oil it was brought to 24.5 deg. C. in a thermostatically controlled water bath and then weighed:

In every case the pycnometer was calibrated for volume directly following each determination. If m equals weight of the dried sample, V equals volume of the pycnometer, s equals density of the oil, and M equals weight of oil plus paper: then,

$$d = \frac{ms}{Vs - M + m}$$

where d equals density of the fiber substance of the sample.

Discussion of Results

Table 2 contains the density values obtained in this study. These densities are not corrected for ash but represent the fibers as they are used in the industry. The possible error in this determination is estimated at about 7 in the third decimal place of the density values. The densities reported are the average of at least two check determinations and, in most cases, more.

The selection of the hydrocarbon (mineral) oil as a displacement medium in this work was based on its nonpolar characteristics, which results in reducing adsorption-compression to a minimum. *N*-Hexane or *n*-heptane are still more nonpolar but so high in cost as to be out of the question if a large number of determinations were to be made.

Literature Cited

[1] Cude and Hulett. J. Am. Chem. Soc. 42, 391 (1920).
[2] Davidson. J. Textile Inst. 18, T175 (1927).
[3] DeMosenthal. J. Soc. Chem. Ind. 26, 443 (1907).
[4] Dunlap. J. Agr. Research 2, 423 (1914).
[5] Hartig. Untersuch Forestbott. Inst., München, 2, 112 (1882).
[6] Haskins and Ewing. J. Am. Chem. Soc. 43, 1787 (1921).
[7] Howard and Hulett. J. Phys. Chem. 28, 1082 (1924).
[8] Krüger. Reported by Herzog. Pulp and Paper Mag. Can., Vol. 24, No. 24, 697 (1926).
[9] Lewis, Cross, and Doree. "Researches on Cellulose," Vol. 4, p. 27 (1910-21).
[10] Lowry. J. Am. Chem. Soc. 46, 824 (1924).
[11] Nave. J. Soc. Chem. Ind. 46, 158-9T (1927).
[12] Richter. Wochenbl. Papierfabr. 45, 1529 (1915).
[13] Sachs. Arb. Bot. Inst., Wurzburg 2, 291 (1897).
[14] Stamm. J. Phys. Chem., Vol. 33, 398-414 (1929).
[15] Stamm. J. Am. Chem. Soc. 52, 3052 (1930).
[16] Williams. Proc. Roy. Soc. 98, 223 (1920).

Sulphite Waste Liquor Tanning Material

W. E. B. Baker was recently granted patent 1,754,600. In making sodium lignosulphonate with production of a product containing calcium by neutralization and concentration of sulphite waste liquor, the calcium is removed by interchange with the sodium of a zeolite, and the sodium lignosulphonate is recovered and is acidified with an organic acid having a relatively low dissociation constant.

Current Paper Trade Literature

Abstracts of Articles and Notes of Papermaking Inventions Compiled by the Committee on Abstracts and Bibliography of the Technical Association of the Pulp and Paper Industry

Clarence J. West, Chairman

For photostatic copies of articles appearing in the Abstract Section, address the chairman of the Abstracts Committee, Dr. Clarence J. West, National Research Council, 21st and B Streets, Washington, D. C. The charge for this service is: Photostats 9 x 11 inches, 18 cents each; 18 x 11 inches, 35 cents each; 22 x 18 inches, 70 cents each; minimum charge, 50 cents. Payment should be made upon receipt of invoice. Copies of United States patents may be obtained from the U. S. Patent Office, Washington, D. C., for 10 cents each. Send currency not stamps.

Boards

Process and Arrangement for the Manufacture of Paper which has the Appearance and Properties of Hand Made Paper. Christian Moes. Ger. pat. 501,258 (May 31, 1927).—A number of individual moulds with wire cloth and moving in a continuous row, all shaken in unison, are passed over a suction box and then to a couch roll. The couch roll is also shaken together with the moulds and here the sheet is couched and carried up to an arrangement for the pressing and drying of the paper. The device is characterized by a frame capable of swinging around a vertical axis and is provided with a guide device for a number of suction boxes whose top surface is covered with a wire mesh in the usual manner. The suction boxes are connected to the vacuum chamber during a part or the entire movement of the moulds. A couch covered with felt is arranged at the end of the row of suction boxes and this oscillates together with the frame.—J.F.O.

Process for the Production of "Batik" or Similar effects on Paper. I. G. Farbenindustrie Akt. Ges. Ger. pat. 500,036 (March 23, 1926). Addition to Ger. pat. 338,105.—In the production of "batik" or similar effects on paper according to Ger. pat. 338,105 completely sized as well as completely dried paper is moistened with suitable solutions or some other means of etching, such as alcohol, soda, etc.—J.F.O.

Process for the Manufacture of Paper which is Reenforced by Joining Two Webs of Paper to a Fiber Gauze which is Glued Between the Sheets. Erwin Kampf Maschinen-unf Apparatebau Anstalt. Ger. pat. 504,573 (May 2, 1928).—The fiber gauze is wound on a roll together with paper or a similar material, the unrolling of which frees the fiber gauze which is then led between two rolls where it is glued to the two webs of paper. According to claim number two, the paper used for supporting the fiber is used over again for the same purpose.—J.F.O.

Process and Device for Making Parchment Paper. Linke-Hoffmann-Busch-Werke, Akt. Ges. Abt. Fullnerwerk. Ger. pat. 502,129 (April 15, 1928).—The web of paper is chilled before it is led into the acid bath which brings the paper in a condition similar to a colloid so that the acid only parchmentizes the surface of the sheet while the inner layer of paper is not impregnated with acid. The cooling cylinders used in the cooling in the usual manner, are arranged in the cooling chamber which is kept closed as much as possible thus assisting in the cooling of the sheet before it is led into the acid bath.—J.F.O.

Process for the Production of Especially Thick Webs of Stock from Ground Wood, Pulp and Similar Materials. A. S. Myrens Verksted, Nor. pat. 47,837 (Dec. 23, 1927).—Two or more webs of stock are formed on separate suction cylinders, pressed separately and then combined and the whole is pressed together into a thick web.—J.F.O.

Process for Making Combustible Material Fire Proof. I. G. Farben-Industrie Akt. Ges. Ger. pat. 503,673 (March 21, 1927).—The combustible material is treated with trianiline of phosphorus or the phosphoric acid or its homologues or derivatives.—J.F.O.

Coated Papers and Printing. J. B. Meyer. Papier-Fabr. 28, No. 37: 581-584 (Sept. 14, 1930).—With improvement in printing methods, the printer demands better paper, more uniform and closed. The calender cannot give these properties as well as coating the paper. A description of the manufacturing of various coated papers, their uses, characteristics and the coating materials used, the advantages and disadvantages, are discussed. The troubles in the coating and printing processes with their causes are given.—J.F.O.

Process for Drenching Paper Stock for Cigarette Paper with Tobacco Juice. Basile Seferiades in Maisons-Laffitte, Ger. pat. 499,011 (July 26, 1927).—Aromatic oils serve for the drenching of the paper, these oils being obtained from valuable tobacco.—J.F.O.

Process for the Manufacture of Embossed Paper, Board or Carton. I. G. Farbenindustrie A. G. Ger. pat. 498,628 (April 17, 1924). Addition to Ger. pat. 473,902.—The manufacture of embossed paper, board or carton, according to Ger. pat. 473,902 follows in the way that the fibers grouped on the wire are sprayed with color solution before the sheet is couched, or it is effected by having the fibers completely dearranged.—J.F.O.

Process for the Manufacture of Embossed Paper for Liners with the Desired Filler. Franz Anton Bayer. Ger. pat. 498,708 (May 18, 1927).—Between the liner and the filler a colored or colorless melted mass is imbedded, which brings up the color and makes the print by means of a heated stamp. Waxes or melted paraffine is used for the melted mass which is rendered adhesive by a mixture of glue, such as gelatine size. Paper liners are also used which are provided on the back side with a melted mass. Further claims are made concerning the bringing out of the design.—J.F.O.

Electrolytic Writing and Drawing Paper, Especially for Electric Reproduction of Pictures. Rudolf Horn. Ger. pat. 498,740 (June 15, 1928).—The paper is drenched with an aqueous, electrically neutral or alkaline solution of organic matters, such as a coloring solution, eventually under addition of electrolytic conductors, which upon the passage of an electric current the soluble electrodes of copper, silver, lead, iron, nickel, aluminum or their alloys, form difficultly soluble compounds, that is a color lake.—J.F.O.

Process for the Manufacture of a Fiberous Material, Paper, Board, Etc., for Packages, Boxes and Similar Objects, the Fibrous Material Having a Metal Covering on Both Sides. Leopold Rado. Ger. pat. 511,370 (May 25, 1927).—On one side of the fibrous material, the metal is applied in a porous form while the other side consists of the usual metal foil.—J.F.O.

Paper Sensitized with Iodide or Iodide and Starch for Electrical Telegraphy or Image Producing Apparatus. Viktor Bausch and Felix Schoeller. Ger. pat. 511,164 (Dec. 2, 1927).—The paper contains a quantity of reduction substances in such a quantity that the content of iodine present in the paper is many times, for example, hundred times that of the reducing substance, for the purpose of preventing the separation of the iodine during the storage of the paper, not, however, during its use.—J.F.O.

Waters

Improvement in the Manufacture of Paper. Societe Anonyme Francaise Kodak-Pathe. Belg. pat. 368,197 (Apr. 30, 1930). To the stock in the beater there is added a special size consisting of a saturated fatty acid in the form of salt, having an iodine number of 40, and even preferably of less than 5.—A.P.-C.

White Water in the Pulp and Paper Industry. Zellstoff Papier 10, No. 6: 400-402 (June, 1930).—The author first classifies the kinds of white water with relation to their source. The various processes for the utilization of the white water is reviewed. —J.F.O.

Use of Chlorine for Slime Elimination. C. T. Birkeness. Paper Tr. J. 91, No. 20: 515-52 (Nov. 13, 1930).—The troubles occurring in paper mills due to slime are briefly outlined. Elimination of existing slime and prevention of its formation can be efficiently accomplished by appropriate introduction of free chlorine into the system, the quantities and points of introduction varying widely according to the particular mill conditions. The chlorine required per ton of paper produced for different grades is roughly as follows: paper board 1 to 4 lbs., book paper 0.5 to 2 lbs.; kraft paper 1 to 3 lbs., tissue 1 to 2 lbs., roofing felt 2 to 5 lbs. Accurate control of the treatment should be maintained. The benefits of the treatment are indicated.—A.P.-C.

Paper Mill Slime. Donald K. Pattillo. Paper Mill 53, No. 51: 4, 6, 8, 32 (Dec. 20, 1930).—A review of the development and operative work during the past 3 yrs. on the elimination and prevention of the formation of slime in paper mills. The benefits of properly controlled chlorination are summarized.—A.P.-C.

Slime in Pulp and Paper Mills with Special Reference to Methods of Prevention. Clara W. Fritz. Research Notes 2, 9-10 (1929).—A study of slime conditions in 4 Canadian pulp and paper mills showed it was present throughout the groundwood, sulphite and paper mill systems. The bulk of the slime was usually found to be composed of filamentous fungi of the mold type, which formed a matted tangle in which bacteria, yeasts and unicellular animals were frequently found developing. It originates from the raw materials (particularly the water) and the air carrying spores and viable vegetative fragments from pieces of dried slime and pulp in the mill. The fungi tolerate a wide range of temperature variation (3 deg. to 19°C) and a wide range of hydrogen ion concentration (pH 4.6. to 7.6). The use of copper sulphate and of caustic soda for preventing slime was found practically useless; some satisfactory results were obtained in certain cases with chlorine. Treatment of the piping, etc. with caustic soda, followed by flushing with clean water, removes slime.—A.P.-C.

Slime Formation Algea and Fungus Browth and its Removal. W. Schmid. Zellstoff Papier 10, No. 12:870 (Dec., 1930). With an increase in temperature of the mill water, the growth of fungus is accelerated. With alkali processes the formation of fungus is appreciably less than with the acid processes. Alum, ferro sulphate, chlorine, carbolic acid or mixtures of these have been used for the removal of slime. A new method for the removal of slime which has met with success is adding chlorine and copper in suitable form to the mill water, in the proportions of about 2 milligrams chlorine and about .2 milligrams copper per liter water.—J.F.O.

Process and Device for Eliminating Algea and Slime in Water and White Water. Georg Ornstein. Aust. pat. 118,771. (Mar. 15, 1930).—Chlorine and copper are allowed to react in the water which is so freed from the slime and the algea. By means of a regulating device, a stream of chlorine is added directly to the water, as well as a stream of copper chloride solution issuing from a container for such, which is also added directly to the water. A heavy formation of slime and algea can be removed by adding one milligram of chlorine and about one tenth milligram of the copper chloride solution per liter and about half that amount is necessary to keep the lines free from slime and such.—J.F.O.

Paper and Pulp Testing

Method for Determining the Degree of Purity of Cellulose Fibers. M. Freiberger, Z. V. Vass and L. Hönig. J. Soc. Dyers Colourists 46: 111-118 (1930).—The present methods of determining the degree of purity of cellulose fibers are discussed and two new quantitative methods given. In Method I the material is extracted with boiling caustic soda and this extract is oxidized with potassium ferricyanide and the excess of the latter back-titrated with thiosulphate. The potassium ferricyanide used is termed the ferricyanide number, and the equivalent is termed the oxygen number. For materials with lower ferricyanide numbers Method II is used. In it, the material is heated in open test tube with caustic soda and potassium ferricyanide, and the excess of the latter is back-titrated. It is assumed that oxidation in these methods is limited to the easily soluble reducing compounds present in the modified cellulose. Charts and tables of results and the effect of variations in the method on the results are included.—A.P.-C.

Machinery

Arrangement for the Piling of Pulpwood. Otto Thurwieser. Aust. pat. 118,328. (Feb. 15, 1930).—The device is especially recommended for small wood yards which are constantly changing position.—J.F.O.

Distributing Conveyor for Pulpwood and Arrangement for the Automatic Piling of the Wood at Determined Points. E. S. Sandberg. Swed. pat. 69,060 (Dec. 9, 1925).—Finn. pat. 12,822 (June 7, 1926).—The conveyor is composed of several suitable conveyor elements of whose single starting and stopping is regulated by a device influenced by the wood.—J.F.O.

Thorne or Knife Barkers. Klimpke and H. G. Klein. Wochbl. Papierfabr. 61, No. 43: 1375-1389 (Oct. 25, 1930).—Rebuttals over an article in Wochbl. Papierfabr. number 38, in which the bark losses are disputed, as well as costs, initial, operation, etc. The above authors are of the opinion that the Thorne barker is the better investment of the two.—J.F.O.

Johannson's Barking Drum. Zellstoff Papier, 10, No. 8: 568-571 (Aug., 1930).—The Johannson's barking drum hangs upon rollers which also revolve the drum. A drum of 2.5 x 7.2 meters rotating at about 4 revolutions per minute, requires about 15 horsepower and the barks about 12.5 solid cubic meters per hour. A description of the drum and its actual operation in a Finnish mill is given.—J.F.O.

Logging and the Barking of Wood in Barking Drums. W. Schmid. Papierfabr. 28, No. 25A 119-125, (June, 1930).—The most favorable pretreatment of the wood and efficiency of barking drums are discussed. A new type of barking drum is described. The author describes the conditions favorable for the use of barking drums, such as when the bark can be easily removed and where cleanliness is not the deciding factor. These conditions occur when the logs are partially barked in the woods, river driven and when they are removed from the water in the summer time and immediately barked. Knife barkers are most suitable when these conditions are reversed. The Thorne barker is also mentioned, but has the disadvantages of high cost and the necessity of an elaborate conveyor system. A portable knife barker, patented by J. M. Lagus of Abo, Finland, is described and found very suitable for operation in the woods and wood yards. This barker and a few others somewhat similar, serves admirably as a prebarker. The article is a comprehensive study of a great number of European barking drums. The logging operations in Scandinavian countries is described.—J.F.O.

Thorne Barkers or Knife Barkers. F. G. Wochbl. Papierfabr. 61, No. 38: 1222-1224 (Sept. 20, 1930).—With knife barkers there is a loss of from 8 to 10% while with the Thorne barker the loss does not exceed 2%. However, the manufacturers of the knife barkers contend that the wood refuse from their barkers can be used for cooking of certain grades of pulp and also

because of the much dryer condition of the bark, it can be more efficiently utilized in the boilers. The loss of wood with the knife barkers is dependent upon the diameter of the log, varying from approximately 15% with 6 dentimeters mean diameter and less, to 4.5% with a mean diameter of 20 centimeters. The average size log is 13 centimeters in diameter which means a loss of about 7.5% with a peeling off of approximately 3.5 mm. The author then gives figures for the interest, etc. for the knife barker and the Thorne barker, the wood loss, the heat value of the bark and other pertinent facts and shows that it actually costs more to use Thorne barkers instead of knife barkers. In conclusion the author shows where each method is most preferrable.—J.F.O.

Investigations Made on the Barking of Wood. "With Special Reference to the Thorne Barker." Report made by H. G. Klein and E. Kuzhals, Papierfabr. 28, No. 41: 645-653: No. 42: 661-669 No. 43: 677-681 (1930).—An exceedingly comprehensive article concerning wood and the barking of same together with complete descriptions of the more important barkers now in use. A great amount of data and curves accompanies this article. The specific gravity of spruce wood is around .45 hence a solid cubic meter corresponds to 453 kilograms bone dry, at about 25% moisture the weight becomes 550 kilograms. One cub. meter of wood corresponds to .75 solid cub. meters. The percentage of bark on spruce wood varies from 7% to 15 according to the diameter of the logs. The bark losses in hand barking amounts to about 6% with a production of 2 to 2½ cub. meters per 8 hrs. With knife barkers the loss averages around 10% varying according to the diameter of the log. A "Bezner" barker will bark 10 cub. meters per hr. of 18 centimeter logs, (average diameter) with about 13 h.p. at a speed of 1200 r.p.m. and with a bark loss of about 7%. The "Bezner" pendel barker, the Fresk, the K. M. V. and the Bautzener, are all fully described, production, bark losses, power consumption, etc. The barking drum is also mentioned. A complete discussion of the Thorne barker, description, operation, capacity and power consumption, are all presented in detail. Various sizes and kinds of wood were used in the Thorne barker, the results with each kind are tabulated.—J.F.O.

Machine for the Barking of Pulp Logs. Badische Maschinenfabrikund Eisengiesserei. Ger. pat. 498,236 (Feb. 1, 1927).—By means of a counter balance and weights, the working roll is pressed against the knife disc.—J.F.O.

Barker. Adolf Riedesel. Ger. pat. 511,977. (Apr. 3, 1928). —The invention is applicable to any type of barker which removes the bark in the direction of the log.—J.F.O.

Machine for the Barking of Logs. Eisengiesserei und Maschinenfabrik. A. G. Ger. Pat. 511,976 (June 2, 1928).—J.F.O.

Barking Machine. Hubert Vogl. Nor. pat. 47,665 (June 26, 1928).—An auxiliary part is placed before the real barker, this part being composed of a small saw, capable of swinging through an arc, which thus separates the knots and other objectionable parts of the log.—J.F.O.

Arrangement for the Barking of Wood. S. P. Holgerisson. Swed. pat. 69,348 (Sept. 22, 1928).—Chains, fastened to a rotating holder are thrown out by a centrifugal force and exert a barking action on the wood which it comes in contact with.—J.F.O.

Barking Drum. A. G. Johansson. Nor. pat. 48,088 (Sept. 20, 1928).—The drum is hung on guide rolls which revolve around the supporting band, and connected with the drive of the drum. —J.F.O.

Scalding Resulting from Opening of Revolving Spherical Digesters. Fritz Lesser. Wochbl. Papierfabr. 61, No. 47: 1496-15000 (Nov. 22, 1930).—A practical article on the adherent dangers present when digesters are opened. The pressure gauges should not be relied upon when the cover is removed.—J.F.O.

Arrangement for a Pulp Digester and Similar Objects with Circulation Pumps for the Cooking Liquor. A Bol. Nordiska Armaturfabrikerna. Finn. pat. 12,771 (July 24, 1926).—While the pressure side of the circulating pump is closed to the top as well as to the bottom inlet of the digester, the suction side stands in connection, by means of two pipes, with the middle of the digester. Simultaneously the pump is connected with the fresh liquor tank and in this manner it provides for the circulation during cooking as well as for the filling of the digester before cooking.—J.F.O.

Lubricating and Packing Means for the Stuffing Box of a Circulating Pump for Pulp Digesters. E. Morterud. Nor. pat. 48,350 (Sept. 25, 1929).—Thickened waste liquor is used as the packing means and for lubricating the stuffing box and bearing of the pump.—J.F.O.

Process for the Emptying of a Pulp Digester. F. I. F. Gothner. Swed. pat. 69,597 (Jan. 26, 1926).—The digester contents are blown under pressure in an enclosed container in which the steam is separated as much as possible from the stock and liquor and led to a precipitating device, while the stock and liquor is conducted directly or through collecting containers to the washers.—J.F.O.

Process for the Blowing out of the Contents of a Pulp Digester into the Diffusors. F. I. F. Gothner. Swed. pat. 69,407 (Aug. 6, 1928).—The steam from the diffusors is led through a separator before it condenses, in order to free it from any accompanying stock or liquor and thereby making the steam suitable for washing the stock after its condensation. After the blowing of the digester is completed, a certain quantity of relatively cold liquor is led through the separator into the diffusor, partly in order to separate the liquor and the stock carried over and partly to precipitate the steam in the diffusor and thereby bringing the pressure down in the digester and diffusor as quickly as possible.—J.F.O.

Process and Arrangement for the Manufacture of Paper on a Fourdrinier. F. H. Banning & Seybold. Ger. pat. 507,728. (Sept. 22, 1926).—Boxes, similar to suction boxes are placed just after the slice, in which water pressure is maintained by means of a regulating device. These boxes are continued under the wire until the fiberous structure of the sheet is completed. —J.F.O.

Fourdrinier, in which the Web of Paper is Carried over from the Top Wire to the Wire Underneath. Paul Erkens. Ger. pat. 498,396 (March 24, 1927).—A web of paper runs on the top wire, and also on the wire underneath a second web of paper is being formed. These two webs of paper come together and in order to avoid the large pressure necessary for this, which damages the formation of the wet web of paper, in the shaking end of the wet end, a suction device is arranged which not only sucks off the water but also couches the two sheets together. —J.F.O.

A Wet End with the Table Rolls Divided into Sections, each Section possesses in itself an Enclosed Endless Wire. Paul Erkens. Ger. pat. 501,417 (Dec. 1, 1926).—The stock runs in the usual manner on to the wire from the breast roll and over the suction boxes to the end roll and partly around this, the sheet being here more or less felted together. It is now taken from the end roll of the first wire, leaves the wire for a short interval and then on to the breast roll of the lower wire. In order to prevent a break in the sheet, both wire sections must have the same period of vibration. According to the arrangement of the invention, a paper is obtained whose double fold, tearing length, stretch, etc. checks more closely in the machine and cross directions.—J.F.O.

Fourdrinier Machine. Johan Walfrid Ljungstrom. Ger. pat. 502,128 (Feb. 15, 1928).—Between the suction box and the couch roll forms the top side of the suction box, in which a suction at the level of the wire, is arranged automatically by means of a moving guide so that the wire can be changed. The suction nozzel is arranged lying against the suction roll and reaching

the entire length of the roll, through which an active and uniformly divided suction is maintained.—J.F.O.

Steam Consumption of Paper Machines. F. Kaiser. Wochbl. Papierfabr. 61, No. 23: 734-740 (June 7, 1930).—A study by the Bayerische Revisions Verein of three paper mills, taking into account the steam consumed by the paper machine and the conditions dependent upon the layout of the mill under which the tests were made. The following statements were made. The steam consumption varied little with the basis weight of the paper. The influence of outside temperature is very noticable. In the test made, 38.6 kilograms of air were required to evaporate one kilogram of water. By reducing the moisture content before the dryers from 67 to 57 per cent, a reduction of about 50 per cent of water to be evaporated is effected. The arrangement of the steam in the dryers plays an important part. The greatest loss of steam is in the steam trap and its connections. The kind of paper and the speed of the machine are also influential factors. In conclusion, the authors of the tests give recommendations as how to reduce steam consumption.—J.F.O.

Method of and Machine for Making Pulp Articles. Ralph W. Chapman assignor to Chapman Fiber Co., Inc. U. S. pat. 1,778,934 (Oct. 21, 1930)—The pulp is pressed into approximately its final form between two dies which are perforated to allow passage of water, and an air current is led to the surface of each die to evaporate and remove the expressed water while the article is still under pressure. The article is then transferred to a pair of forming dies to shape it to its final form. One of the dies is imperforated and heated, while the second one is perforated to allow escape of the steam formed, and the pressure is maintained until the article is dry.—A.P.-C.

Device on a Parchmentizing Machine to Prevent the Paper from Winding Itself onto the Rolls of the Press. Papier-und Pergamentpapierfabrik Seltmans G. m. b. H. Ger. pat. 506,696 (May 4, 1929).—The invention concerns itself with a parchmentizing machine which conducts the paper through the trough containing the parchmentizing bath and in such a manner that guides are unnecessary.—J.F.O.

Paper Machine for the Manufacture of One Sided Calendered or Colored Paper. Victor Antoine. Ger. pat. 499,302 (May 29, 1928).—The invention consists of a machine in which the liquid is added by means of a pad at the angle formed between the sheet of paper and one of the spreader rolls. The patent is characterized in that the smoothing rolls are arranged immediately before the driers.—J.F.O.

Machine for the Manufacture of Corrugated Paper. Gunther Clemens. Ger. pat. 496,936 (Aug. 2, 1928).—According to the invention, the disadvantages with the usual type of grooved roll is avoided. The partition does not serve as the bearing part of the roll but as a stiffened shaft passing through the wall of the roll. By arrangement of the bands of grooves the rolls can be driven by conical gears placed opposite and capable of being regulated, so that the bands of grooves which unite with the driving roll suffer no unseen tension.—J.F.O.

Process for the Sorting of Paper, etc., in Sheets or in a Continuous web. Papyrus A. G. & Kahr Buchner. Ger. pat. 496,601 (Dec. 24, 1927).—Webs of paper consisting of several layers is illuminated from a source of light so that the rejects can be seen and withdrawn.—J.F.O.

Device for the Automatic and Continous Mixing of a Determined mixture of Stocks and Various Consistencies. Arca-Regler A. G. Ger. pat. 495,626 (June 11, 1929).—The device according to Ger. pat. 476,338 is bettered in many ways. The overflow, which serves to hold a constant level in the apparatus, can be set by a regulating sluice to a height corresponding to the character of the stock being mixed. A nozzle, capable of being regulated, is used to limit the flow from the container. Since the container does not have any free level, a level pipe is provided, the gradation of which can be read in terms of consistency at the time of mixing.—J.F.O.

Process for the continuous accurate Measuring of the quantities of liquids, emulsions and suspensions being delivered. Max Schiechel. Ger. pat. 496,241 (Oct. 21, 1928).—A sample of liquid is taken at regular intervals from a continuous uniform flow. The measuring device is arranged in a container over the liquid being delivered. It is composed of the pneumatic feed, the feed container, outlet, the reducing valve and the funnel to receive the water with its feed pipe. The reducing valve is formed of a revolving circular plate with one or more slits through which the stream of liquid can be caught in the receiving device during its flow through the outlet. Further claims concerning the formation and function of the reducing valve are made.—J.F.O.

Process for the automatic and Continuous manufacture of a determined relation of mixtures of stocks of various consistencies. Arca-Regler Akt. Ges. Ger. pat. 495,181 (March 19, 1929).—The method of regulation described in the main patent 476,338 is influenced by an action which is brought about by the uneven requirements of the pump. This action was imparted so that a space with constant level was set up before the container which took the impulse for the mixing process.—J.F.O.

Screen and Spreading Arrangement to Obtain Uniform Division of the Liquid in the Upper Part of a Stock Container. E. Morterud. Nor. pat. 48,189 (May 14, 1929).—Several concentric ring shaped screen surfaces each provided with a separate liquid inlet.—J.F.O.

Storage and Handling of High Density Stock. Merton S. Fogerty. Paper Ind. 12: 1393-1394 (Nov. 1930).—A description is given of a simple system for the storing and handling of high-density stock (6 per cent consistency). It consists essentially of a horizontal three-compartment tank with a double screw propeller on one end similar to the Bellmer bleacher. The draw-off is through a pipe elbow leading from the bottom of one of the low points in the tank, with a drop of 2 feet and a short connection to a two-lobe rotary stock pump. The advantages of this system, particularly for combined pulp and paper mills, are briefly discussed.—A.P.-C.

Device for the Mixing of Paper Stock with Dilution Water. Hellmut Martin. Ger. pat. 505,084 (Oct. 26, 1927).—A revolving drum with slatted sides is so arranged that the dilution water is added to it from below and the paper stock to be diluted is added at the top. The drum is driven by a turbine which is placed within the inlet pipe for the dilution water and also driven by force of this water.—J.F.O.

Device for Fine Regulating of the Consistency of the Stock Entering onto the Wire of a Paper Machine. Cellulosefabrik Okriftel A. M. Ger. pat. 500,127 (Sept. 23, 1926).—Back of the usual foam compartments between the walls of the slice, a solid or movable foam sector is used which can be regulated in its slope and height.—J.F.O.

Vertical Mixing Tank. Otto Bracker, Hanau. Wochbl. Papierfabr. 61, No. 52: 1685-1686 (Dec. 27, 1930).—A description of a new patented mixing tank which is especially suitable for the preparation of solution of size, alum, color, bleach liquor is given. The mixing tank displaces the usual tank in which a stirrer is used which soon has the entire contents of the tank in rotation with the result that there is little actual mixing. The tanks consist essentially of a revolving shaft which has several rings for distributing the materials at different levels in the tank.—J.F.O.

Hydraulic Press, Especially for the Packing of Paper Rolls and Similar Materials. A. S. Eureka Mek. Verksted. Nor. pat. 48,039 (May 5, 1928).—The reciprocating motion of the piston of the press is influenced indirectly by means of a rider on the shaft of the piston which in turn influences the opening and closing of the pressure means to the piston.—J.F.O.

Section of the

COST DEPARTMENT

of the

American Paper and Pulp Association

Edited by T. J. Burke C. A. Director Cost Dept.

The Economics of Marketing

By Dr. W. J. Donald[1]

Manufacturers and distributors may as well make up their minds that it is the consumer and the representatives of consumers who will dominate the determination of how goods shall be distributed, at what price, in what quantities, at what quality, where and when.

A manufacturer's decision to adopt a certain marketing policy, certain channels of distribution for example, is really only a decision to make an experiment. His program may be ultimately successful, it may be quickly disastrous or it may persist for a time by dint of extraordinary effort, but the ultimate decision will be made by the consumer and by his representatives, the retailer or other distributor.

This is a practical way of saying that economic values are derived from the satisfaction of wants or, in other words, from the utility of commodities to the consumer, either utility of the commodity itself or of the commodity and the service attached to the commodity. The exchange relationship of any two commodities is in inverse ratio to the least important satisfaction or utility provided by the last unit of the commodities consumed.

To be sure, for most commodities which can be reproduced the subjective cost involved in producing the last unit equals the subjective utility or satisfaction acquired from the last unit produced and this fact often leads producers to take the position that values are determined by costs, by which they mean marginal costs.

Nevertheless, there are commodities, limited in supply, the cost of which may be negligible though the value or price of them may be considerable. It is such cases as well as cases of monopolized utilities which support us in the assumption that economic values are derived from utility rather than from cost even though for many commodities the marginal cost and the marginal utility are equal.

The school of economists who held that values are determined by costs has long since been on the run. If they had not already been practically disposed of by the utilitarian school of economists, certainly the buyer's market of the last decade would have brushed them aside, the economics of the current depression offering a hangman if one were still necessary.

The sooner manufacturers and distributors get their heads thoroughly permeated with the idea that the economics of marketing is bound up with the interests of the consumer, the sooner they will begin to approach problems of marketing administration on a sound economic basis and on a sound social basis as well .

At first glance this may sound like economic fatalism or again it may sound like the doctrine of the survival of the fittest, but the utilitarian school of the "dismal science" has never issued a dictum to the effect that business executives may not use intelligence in discovering what the market wants, when it wants it, where it wants it, in what quantity or the price at which it wants it.

Nor does our point of view indicate that only the fittest must survive. As a matter of fact, it is necessary only that one shall be somewhat above the marginal producer to keep in the economic race. As a rule, it is not even necessary to be fifty per cent up in the scale of managerial efficiency in order to escape financial annihilation, but it is far more profitable to act upon the assumption that the more one knows about the market, particularly the more one understands the market intelligently, the greater the likelihood of business perpetuation and of corporate profits.

Distribution Distinguished from Marketing

When one begins to survey the literature of marketing and to recall the discussions of marketing, one is impressed by the looseness of the use to which various terms are put and at any given time a common understanding of any one term is usually in transition. In this paper I am discussing "The Economics of Marketing" because I find it increasingly the case that the term "distribution" refers to the physical movement and storage of goods—warehousing, shipping, transportation and delivery and the stocking of goods for sale.

"Selling" is gradually taking on the narrower meaning of effort involved in personal persuasion of the customer to purchase. "Advertising" is that effort which is designed to give direction to the use of the consumer's purchasing power. "Merchandising" is the process of translating consumer demand into a program of creating utilities. Marketing, to most manufacturers, has come to include advertising, selling, distribution, and at least half of what the term merchandising embraces.

When one begins to survey economic literature, one finds next to nothing that can be interpreted as the application of economic principles or economic theory to marketing except the recognition, often forgotten, that the production of utilities not only the creation of form utilities but also place, time and possession utilities and economic literature usually illustrates economic principles and

[1] Managing Director American Management Association.

laws by reference to the creation of form utilities usually produced in the manufacturing process and comparatively neglects the other three types of utility which are embraced in the marketing process.

A great deal of popular discussion of marketing problems tacitly assumes that comparatively little value, if any, is created either by advertising, selling, distribution or merchandising and out of that neglect of place, time and possession utilities arises a large part of the misunderstandings regarding the spread between the expenses of production of form utilities and the ultimate price to the consumer.

It is forgotten, for instance, that it costs 18 cents per year to store a bushel of wheat, that additional expenses are involved in the transportation of wheat from farm to elevator or from elevator to flour mill or to seaboard, and that still other expenses are involved in the process of transferring ownership from farmer to ultimate consumer.

It is the failure to recognize that additional utilities are created in the course of the marketing process which is largely at the basis of the proposals for eliminating the middleman and this fallacy has never been a monopoly of the demagogue for even manufacturers have at times fallen into the trap of assuming that profits could inevitably be increased, that is, the margin between expenses of production and price, if the middleman could be eliminated by some such device as marketing direct to the retailer or direct to the ultimate consumer. Many a manufacturer has found out to his chagrin that the creation of certain place, time and possession utilities require effort and expenses whether performed by the manufacturer or performed by others and he has also discovered sooner or later that it takes more than marketing strategy or selling skill or advertising pressure to make the consumer find in his product utilities which were not there and which could not, therefore, for any length of time find expression in a greater value of exchange, or, to put it in dollar terms, a greater price.

In an economic sense, therefore, *marketing* as we usually think of it and *production* as we usually think of it are simply two different stages of the same thing, the production or creation of utilities, and this economic concept argues strongly for general management *to view them as a unit and to stress more than ever before greater coordination of the two in the interests of profit as well as in the interests of the consumer who is the final arbiter of the world of business.*

The utilitarian economist naturally emphasizes the consumer approach to marketing, an approach which no business man can neglect with justification, especially in times like these which so obviously present a buyer's market. If ever market research were needed it is in this period since the war. If ever we should be conscious of declining marginal utilities it is in this post-war period of declining prices. If ever we should have joined hands with those who recognize the dominance of the consumer in the determination of economic values it is in this post-war period of rapid changes in consumer emphasis, rapid substitution of one commodity for another in satisfying wants and consequent fluctuations, usually downward, of marginal or least important wants which are satisfied by an increasing supply of commodities.

Business men frequently are heard to state that prices must cover the expenses of production in which, of course, they include or should include the expenses of producing place, time and possession as well as form utilities, in other words, the expenses of marketing. But many business men have learned that values in exchange or prices do not always cover these expenses of production and in the course of time they come to learn that the factors of production, such as labor, land and raw materials, capital and management, get their values from the value of the product. They discover this in some very practical, and sometimes painful, ways as, for instance, when it becomes necessary to write off the value of equipment, allowances for goodwill, investments in warehouses, in research or in advertising, or when sometimes they start anew after bankruptcy proceedings with what were formerly regarded as expenses of production wiped out by their obliteration in the process of reorganization.

The trouble with much American industry has been that it has insisted on producing what it wished to produce rather than on producing what the market wanted. It has been production minded rather than market minded. It has wasted its expenses of production on trying to create form, place, time and possession utilities for which there was not a sufficient demand. This misdirected effort first appears in the production of form utilities, but unfortunately it usually does not stop there. If it did the situation would more rapidly correct itself.

Excess production of form utilities is followed by extraordinary efforts to create demand and it may be said with a great deal of truth, though with too little acceptance on the part of marketing executives, that of all misdirected effort that devoted to trying to create demand suffers most from the effects of the defiance of economic principle.

The Elasticity of Demand

In the study of markets, or to put it more fundamentally, in the study of consumer demand, attention must necessarily be given to the question as to whether or not demand for a particular commodity is elastic or inelastic, yet all too frequently marketing programs are built apparently on the assumption that there is no point of satiety, no saturation point or that a market can be enlarged indefinitely by an increase in effort or a decrease in price. Yet nothing is further from the truth and advertising programs, selling programs and production programs are not infrequently built on a scale which ignores not only the probable, but even the potential market for a commodity.

The records of business reveal many instances of efforts to expand business coming flat up against a market that is already saturated and incapable of expansion. Such cases serve to illustrate effectively excessive advertising and selling and inadequate merchandising.

Diminishing Returns

Another economic law that is frequently disregarded in marketing is the law of diminishing returns. Failure to recognize this principle characteristically results in marketing programs in which the profits of an enterprise are dissipated in an effort to secure the last 10 per cent of business. Ignorance or disregard of the law has led many a company into a program of marketing on a national scale when the same amount of effort spent on a limited territory would have achieved far greater results.

Such programs characteristically adopt expensive programs of advertising in national consumer media, a considerable part of which is entirely barren, whereas a similar appropriation spent in a limited territory, supported not only by good merchandising but by concentrated selling effort would have turned losses into acceptable or even handsome profits.

In some cases manufacturers with a product of high quality and a limited output have undertaken to cultivate all grades of consumer when a better direction of marketing effort would have sought out a particular class of con-

sumer concentrated on that group and would have ignored other markets more difficult or more expensive to reach.

The disregard of the law of diminishing returns has led other companies into efforts at export programs or into disillusioning efforts to reach the consumer direct instead of through the usual channels of trade. There is evidence that the sobering effect of the declining price levels of the last decade, an experience somewhat magnified in the last year, has been bringing back to mind some elementary economic principles in the production of those utilities which are embraced in marketing.

In other instances manufacturers have undertaken programs of increasingly intensive cultivation of territories sometimes with no admission that a point of diminishing returns would be reached. Most of us can recall instances of companies which have adopted programs of progressive cutting of territories for salesmen, programs which were successful at first in terms of increased earnings for the salesmen as well as increased volume for the corporation, but enthusiasm for such programs has too often made marketing executives blind to the fact that a point of diminishing returns could be reached with the result that we observed the exhibit of a volume-crazed sales executive driving, figuratively, at 90 miles an hour, crashing through the barrier of the profit line before the general manager could get the marketing program under control.

An awareness of the law of diminishing returns is reappearing, however, in a number of forms such as selective distribution, sales cost accounting, systems of compensation for marketing executives based on profit rather than volume and a type of market analysis which undertakes to discover sales potentials, to establish sales quotas and standard sales costs.

In a period of restricted consumer purchasing power, business has the alternative of going on comparatively blind, feeling its way, or of adopting market research as one of the chief tools of keeping marketing effort within the realm of increasing rather than decreasing returns.

Another application of the principle of diminishing returns has a bearing on the choice of effort expended in various phases of the marketing process. One company emphasizes personal selling pressure with comparative neglect of advertising and still more usual neglect of merchandising. What is happening in many such cases is that one or more kinds of marketing effort are used beyond the point of increasing returns and what most marketing programs need is such an application of the law of diminishing returns as will result in a balanced use of different kinds of marketing effort.

There are many cases in which so much confidence is placed in advertising that all the manufacturer succeeds in accomplishing is advertising the need for the product, a consciousness of which sells the competitor's product because the advertiser has failed to use enough selling effort to get his own goods on the dealer's shelf. In most companies an increased use of merchandising effort along with no change in the amount of selling and advertising effort would result in considerably increased marketing returns, or to put it another way, in greater increase in place, time and possession utilities.

Principle of Substitution

Another economic principle which is too frequently forgotten is the principle of substitution, the possibility open to buyers of substituting other goods for those which a producer may offer. In a primitive economic life the power of substitution was comparatively unimportant. The consumer was more or less confined to choosing which want would go unsatisfied. But with the vast improvement in the processes of manufacturing, transportation and communication, the choice of the consumer became greatly expanded and much more complicated.

Today the manufacturer finds himself faced by the principle of substitution, not merely in the choice of what want will be satisfied, but by the choice of which several commodities will be chosen to satisfy the same want. The consumer can choose between electricity and gas for heating and lighting purposes. He can choose between heating by coal or fuel oil. He can choose between wood, concrete, brick or steel construction. He can choose between a radio, a talking machine or other mechanical means of providing music. Or he can choose to participate himself in the satisfactions of the musician.

For clothing he can choose between cotton, wool and more recently cellulose products. He can choose between riding the street car, a bus or his own automobile.

In other words, the extent to which the power of substitution is in effect today has been vastly increased even in the last decade and still more over the last fifty to a hundred years. Yet, many of our judgments in marketing take altogether too little cognizance of this fact.

Even many market research programs analyzing consumer demand seem to be almost blind to the principle of substitution and industries go on expanding as though all they had to fear were their competitors in their own particular line of business.

Another bit of evidence of this blind spot lies in many of the 19th century characteristics of many of our statutes. The Sherman anti-trust law, for instance—a public expression of the fears of monopoly—blythely assume that concentration of industry in large organizations, especially if it is concentrated into one large corporation, affords an opportunity to charge monopoly prices vastly in excess of all the expenses of production. Even 40 years after the passage of the Sherman anti-trust law we still think largely that this is a true interpretation of what would happen if concentration of industry reached such a point. To be sure, there are business men who, too, would be so blind to the principle of substitution that they would undertake to charge all that the traffic would bear and so over-reach themselves and bring down the structure about their heads, not only to their own discomforture and financial failure, but also to both the current and the ultimate disadvantage of the consumer.

Some public utilities have shown that they have this type of economic blind spot, but for every public utility executive so handicapped there has been another sufficiently wise in economic principles to see that such a policy is destructive of his own best interests in a market in which the power of substitution has been raised far beyond the expectations of primitive 19th century lawgivers or the economic backwardness of 20th century politicians.

Under-Consumption and Over-Production

In a time of business depression following misdirected industrial and economic expansion the business world suddenly becomes vocal with economic theories more or less sound regarding the business upheaval. Today it is generally assumed that the productive capacity of the world is excessive and that consumer purchasing power is inadequate to absorb the capacity of industry to produce. Fundamentally, however, the producer is also the consumer and, except for the saving of capital goods still further to increase productive capacity, production equals consumption.

It is an economic principle that the consuming power of a community is indefinitely great. By this consuming power we refer to the power to consume the total production of human effort rather than any particular

products for some of which there is an inelastic demand. But it is beyond economic comprehension that there can be over-production in a nation or a world in which poverty still exists or in which some wants of all still remain unsatisfied and in which some classes of people are less than satisfied on all their wants.

Misdirected Investment of Capital

If we could come to think of misdirected production or misdirected investment of capital we could be getting nearer to sounder thinking about business depressions and their causes. It is at this point at which the economics of marketing is faced with a tremendous challenge. Some of us find the evils of our economic system, especially those which find expression in recurring industrial and financial depression, not in excessive saving which finds its way back into economic activity in the creation of additional capital goods, but in the diversion of too much capital into unnecessary directions and the limitation of the investment of capital in other directions.

Business will help to find the way to avoid such recurring crises by a much more intensive study of consumer demand, not only by the individual company, but by whole industries organized through their trade associations and also by even more broad visioned efforts in the study of the economics of consumption. Fickle as the economic man is in his capacity as a consumer, nevertheless, we have not more than scratched the surface of the problem of anticipating the possible changes in human wants and their bearing on long term plans for satisfying those wants.

Nor can we attack this problem too soon. In primitive industrial and economic communities, such as in pre-civil war America, anticipation of consumer desires was a comparatively simple process. In the America of the 20th century its complexities have been increased by vastly improved means of communication and transportation, by the increased tempo of life, by the cosmopolitanism of our population and the multitudinous cross-currents of human motives.

In the last ten years with world communication and transportation greatly improved, with the different continental civilizations infringing on each other as never before and with promise of a smaller and smaller world and closer interrelations, the possibilities of more extreme crises increase if the problem is not attacked intelligently. But equally the possibilities of averaging out the trends through intelligent action may also be increased.

The job of analyzing the consumer market, of anticipating and interpreting consumer demand and directing consumer purchasing power back in to a merchandised production offers difficulties hitherto unanticipated and possible achievements hitherto undreamed. But if we are to approach the problem of recurring business instability constructively we must do so in terms of economic principle and must cast aside some of the political and social prejudices that have lasted too long not only within nations but also between national economic units.

When we shall have done so we will be well on our way toward a proper direction of capital and other effort devoted to production into socially and economically profitable channels and toward a balanced economic structure tuned to consumer demand and we may hope for a situation in which production and consumption may be balanced and recurring crises largely avoided.

With the increased tempo of business change intelligent analysis of consumer demand may be expected to shorten and minimize the dislocation of economic life that comes from misdirected investment of capital and misdirected effort.

New Equipment for Rubber Printing Plates

A new hydraulic-electric vulcanizer for making rubber printing plates is announced by the Rubberprint Equipment Corporation, of New York. It differs in many respects from any equipment heretofore used for this purpose. It produces perfect rubber plates of 65-screen halftones, line cuts, and type and rule matter of all kinds, for printing on any kind of surface, with either rotary or flat-bed presses, using either oil-base, water-color, or aniline inks. The complete equipment includes not only the vulcanizer, which has many special features, but also a grinder for truing-up cuts before molding and a saw for trimming the molds which are used in this process.

It is sold by the Rubberprint Equipment Corporation, whose general manager, Harald H. Heinrich, is well known in the graphic arts field by the firm name of H. H. Heinrich, Inc. The latter concern sells paper bag machinery, aniline printing presses, web offset presses, and other equipment, while the Rubberprint Equipment Corporation handles the new vulcanized, auxiliary equipment, and aniline inks. The new vulcanizer, which is made in three sizes, produces both molds and rubber plates. Molds are made from original engravings, either line or halftone, or from electrotypes, or type forms. The special composition used for molding is said to produce a very accurate impression, comparable to the finest electrotype molds made in wax or lead. Once a mold is made, it can be used repeatedly for producing any needed number of rubber plates. The latter are made in the same hydraulic-electric vulcanizer which produces the molds. A mold can be made in about twelve minutes, and a rubber plate in about fifteen minutes.

The essential features of this process are (1) a special grade of rubber, (2) accurate temperature control, (3) accurate pressure control, (4) accurate depth of plate, and (5) accurate timing of the vulcanizing process. The rubber used is specially treated to resist the oils and driers in oil-base inks, and it is not injured by water-color or aniline-inks. Plates made from this rubber have been run over 500,000 impressions with oil-base inks and over 1,000,000 impressions with aniline inks.

The temperature control is automatic, by means of a thermostat. Pressure control is secured by means of a gauge, which shows the exact thickness of the mold or the bed of the vulcanizer. There is also a plate thickness gauge, which shows the exact thickness or the mold or rubber or rubber plate being made, and another gauge which prevents the bed and top plate of the vulcanizer from being forced too close together. Timing is controlled by a special alarm clock which enables the operator to busy himself with other work during the period of vulcanizing. A vertical electric grinder, which is a part of the equipment, is used to true-up the backs of engravings and electrotypes before molding, and is then used again to insure an absolutely uniform thickness of the rubber plate itself. Another auxiliary unit, a combination saw and grinder, is used for trimming the edges of molds and for cutting down projections caused by low spots in type or rule forms.

Manufacturers of bags and sacks for cement and other products, where printing on an uneven or rough surface is essential, have made substantial savings through the Rubberprint Process of printing. Manufacturers of glassine bags have been among the first to adopt the Rubberprint Process, because of the beautiful colors and tones obtainable from rubber plates. The bags can be made and printed in one operation and immediately packed for shipment.

Chemipulp Process:

FOREMOST IN SERVING CHEMICAL PULP MILLS

TO — Improve efficiency.
— Reduce costs.

BY — Modern scientific methods.
— Wide operating experience.

Hot SO_2 Liquor & Gas Recovery—eliminates expensive cooling equipment — recovers heat — saves steam — eliminates acid dilution from steam condensation — reduces boiler load peak — strengthens acid — accelerates penetration — cuts sulphur — increases yield and capacity — has been termed, " the all round fixer" for SULPHITE making.

Broadly Covered by U. S. and Canadian Patents

CHEMIPULP PROCESS, INC.

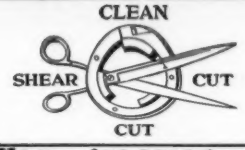
330 Woolworth Bldg., Watertown, N. Y.
1017 White Bldg., Seattle, Wash.
in Canada
319 Castle Bldg., Montreal, Que.

a clean cut ~ a sure cut ~ a shear cut ~

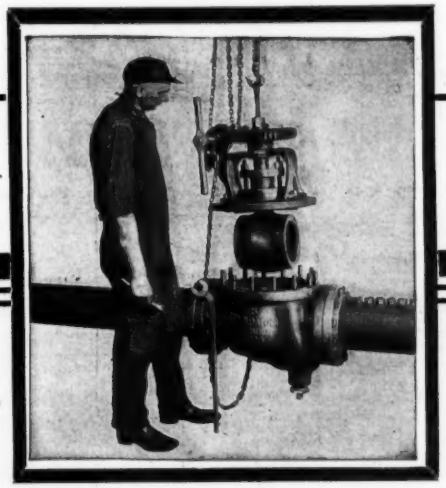
From tissue to Boxboard

it's all the same to—

LANGSTON
Slitters & Rewinders



FAIRBANKS NEW "SPHERO" VALVE



Continuous operation in paper mills demands quick replacements to all equipment.
SPHERO VALVES are easily repaired without detaching the body from the pipe line.
Lever type in sizes ¾-in. to 4-in. Gear type in sizes 4-in., 6-in. and 8-in. For 200 Pounds Steam Working Pressure.

Write for Bulletin V-103

THE FAIRBANKS COMPANY
BOSTON NEW YORK PITTSBURGH
Factory: Binghamton, N. Y. *Distributors Everywhere*

West Virginia Pulp and Paper Company

Manufacturers of

SUPERCALENDERED
and
MACHINE FINISHED BOOK and LITHOGRAPHIC PAPERS

Offset, Envelope, Bond, Writing Cover and Music Paper, High Grade Coated Book, Index Bristol, Post Card, Kraft and Label Papers

also

Bleached Spruce Sulphite and Soda Kraft Pulp

230 Park Ave. New York — 35 East Wacker Drive Chicago
503 Market St., San Francisco, Cal.
Sixth and Chestnut Sts., Philadelphia, Pa.

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING AUGUST 8, 1931

SUMMARY

Cigarette paper	2076 cs.
Wall paper	6 bls., 36 cs.
Paper hangings	28 cs.
News print	7926 rolls
Printing paper	70 rolls, 22 bls., 10 cs.
Wrapping paper	36 rolls, 29 cs.
Packing paper	10 cs.
Filter masse	5 cs.
Filter paper	307 bls., 16 cs.
Drawing paper	1 cs.
Filter pulp	50 bls.
Coated paper	5 cs.
Surface coated paper	53 cs.
Gold coated paper	4 cs.
Metal coated paper	68 cs.
Photo paper	3 cs.
Shoe covering paper	6 bls.
Colored paper	6 cs.
Decalcomania paper	44 cs.
Tissue paper	39 cs.
Stencil paper	4 cs.
Writing paper	14 cs.
Envelopes	130 cs.
Card board boxes	7 cs.
Card board	226 cs.
Paper tape	2 cs.
Paste boards	2 cs.
Raw card	11 cs.
Miscellaneous paper	272 rolls, 167 bls., 49 cs.

CIGARETTE PAPER

Protecto Products Co., Vincent, Havre, 1 cs.
Protecto Products Co., Liberty, Havre, 3 cs.
Champagne Paper Corp., Liberty, Havre, 344 cs.
Brown & Williamson Tobacco Co., Olympic, Southampton, 10 cs.
Brown & Williamson Tobacco Co., Lafayette, Havre, 6 cs.
Liggett & Myers Tobacco Co., Lafayette, Havre, 61 cs.
American Tobacco Co., Collamer, Bordeaux, 900 cs.
De Manduit Paper Corp., Collamer, St. Nazaire, 751 cs.

WALL PAPER

A. C. Dodman Jr., Inc., Carmania, Southampton, 8 cs., 2 bls.
R. F. Downing & Co., Olympic, Southampton, 3 cs.
F. J. Emmerich, Scythia, Liverpool, 1 bls., 4 cs.
Heemsoth Basse & Co., St. Louis, Hamburg, 3 bls.
Guaranty Trust Co., Hamburg, Hamburg, 18 cs.
Heemsoth Basse & Co., Hamburg, Hamburg, 1 cs.
F. A. Binder, Hamburg, Hamburg, 2 cs.

PAPER HANGINGS

W. H. S. Lloyd & Co., Carmania, Southampton, 10 cs.
Whiting & Patterson Co., Inc., Carmania, Southampton, 4 cs.
Whiting & Patterson Co., Inc., Samaria, London, 12 cs.
Hudson Forwarding Co., Lafayette, Havre, 1 cs.
Hudson Forwarding Co., Paris, Havre, 1 cs.

NEWS PRINT

——, Pilot, Ortviken, 184 rolls.
Jay Madden Corp., Stuttgart, Bremen, 219 rolls.
International Paper Co., Svanceholm, Dalhousie, 2,792 rolls.
W. H. Bell, Markland, Liverpool, N. S., 4,288 rolls.
Perkins Goodwin & Co., St. Louis, Hamburg, 178 rolls.
Stora Kopparberg Corp., Drottningholm, Gothenburg, 50 rolls.
Perkins Goodwin & Co., America, Hamburg, 215 rolls.

PRINTING PAPER

Japan Paper Co., Carmania, Southampton, 3 cs.
Meadows Wye & Co., Carmania, Southampton, 1 cs.
International F'd'g Co., Volendam, Rotterdam, 5 cs.
C. H. Forsmann Co., Lafayette, Havre, 1 cs.
——, St. Louis, Hamburg, 22 bls., 70 rolls.

WRAPPING PAPER

Standard Products Corp., Lapland, Antwerp, 36 rolls, 16 cs.
Borden Riley Paper Co., Stuttgart, Bremen, 13 cs.

PACKING PAPER

K. Pauli Corp., Volendam, Rotterdam, 2 cs.
Chase National Bank, Hamburg, Hamburg, 8 cs.

FILTER MASSE

A. Giese & Son, Volendam, Rotterdam, 5 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., Carmania, Southampton, 10 cs.
A. Giese & Son, Carmania, Southampton, 42 bls.
A. Giese & Son, Olympic, Southampton, 33 bls., 4 cs.
J. Manheimer, Olympic, Southampton, 232 bls.
H. Reeve Angel & Co., Inc., Olympic, Southampton, 2 cs.

FILTER PULP

A. Giese & Son, Hamburg, Hamburg, 50 bls.

DRAWING PAPER

Keuffel & Esser Co., America, Hamburg, 1 cs.

COATED PAPER

W. A. Foster & Co., Carmania, Southampton, 4 cs.
——, American Merchant, London, 1 cs.

SURFACE COATED PAPER

P. C. Zuhlke, Lapland, Antwerp, 2 cs.
Gevaert Co. of America, Lapland, Antwerp, 51 cs.

GOLD COATED PAPER

F. Murray Hill Co., Stuttgart, Bremen, 4 cs.

METAL COATED PAPER

Globe Shipping Co., Stuttgart, Bremen, 1 cs.
K. Pauli Corp., Hamburg, Hamburg, 38 cs.
——, Hamburg, Hamburg, 23 cs.
Taub Hummell & Schnall, Hamburg, Hamburg, 6 cs.

PHOTO PAPER

J. J. Gavin, Olympic, Southampton, 3 cs.

SHOE COVERING PAPER

Enduro Manfg. Co., Samaria, London, 6 bls.

COLORED PAPER

J. Beckhard Co., Stuttgart, Bremen, 1 cs.
Dingelstedt & Co., Bremen, Bremen, 5 cs.

DECALCOMANIA PAPER

L. A. Consmiller, Bremen, Bremen, 4 cs.
C. W. Sellers, Bremen, Bremen, 10 cs.
C. W. Sellers, Europa, Bremen, 11 cs.
C. W. Sellers, St. Louis, Hamburg, 9 cs.
B. F. Drakenfeld & Co., Scythia, Liverpool, 10 cs. (duplex)

TISSUE PAPER

B. F. Drakenfeld & Co., Scythia, Liverpool, 1 cs.
P. J. Schweitzer, Pres. Monroe, Marseilles, 38 cs.

STENCIL PAPER

Bush Service Corp., Hamburg, Hamburg, 4 cs.

WRITING PAPER

Guibout Freres, Olympic, Southampton, 3 cs.
Guibout Freres, Paris, Havre, 4 cs.
American Express Co., Liberty, Havre, 2 cs.
Bloomingdale Bros., Liberty, Havre, 5 cs.

ENVELOPES

J. Beckhard, Stuttgard, Bremen, 130 cs.

CARD BOARD BOXES

J. Personneni, Pres. Monroe, Genoa, 4 cs.
French American Importing Co., Pres. Monroe, Marseilles, 3 cs.

CARD BOARD

American Express Co., Hamburg, Hamburg, 226 cs.

PAPER TAPE

E. B. Baehr & Son, Lafayette, Havre, 2 cs.

PASTE BOARDS

D'Orsay Perfumerie, Lafayette, Havre, 2 cs.

RAW CARD

F. C. Strype, Stuttgart, Bremen, 11 cs.

MISCELLANEOUS PAPER

W. A. Foster & Co., Carmania, Southampton, 1 cs.
Bush Service Corp., Carmania, Southampton, 1 cs.
Japan Paper Co., Pres. Johnson, Kobe, 12 cs.
Japan Import & Export Commission Co., Pres. Johnson, Kobe, 5 cs.
C. Bruning & Co., Volendam, Rotterdam, 65 rolls.
Simfred, Lafayette, Havre, 4 cs.
Schneider Bros., Lafayette, Havre, 3 cs.
Keller Dorian Paper Co., Lafayette, Havre, 17 cs.
American Express Co., St. Louis, Hamburg, 1 cs.
Keller Dorian Paper Co., Mauretania, Southampton, 5 cs.
The Borregaard Co. Inc., Drottningholm, Gothenburg, 207 rolls, 167 bls.

RAGS, BAGGINGS, ETC.

Amtorg Trading Corp., Cliffwood, Leningrad, 359 bls. rags.
H. W. T. Mali, Vincent, Dunkirk, 88 bls. flax waste; 29 bls. jute waste.
Castle & Overton, Inc., Vincent, Havre, 54 bls. rags.
Darmstadt Scott & Courtney, Winona Co., Liverpool, 66 bls. bagging.
R. Canovai & Son, Cabo Mayor, Leghorn, 55 bls. rags.
Amtorg Trading Corp., Excello, Odessa, 1138 bls. rags; 27 bls. jute cuttings.
Darmstadt Scott & Courtney, Ala, Antwerp, 107 bls. bagging.
Irving Trust Co., Ala, Antwerp, 140 bls. bagging.
——, Samaria, London, 33 bls. rags.

OLD ROPE

Banco Com'l Italiana Trust Co., Cameronia, Glasgow, 44 coils.
Brown Bros. Harriman & Co., Borodino, Newcastle, 184 coils.
Amtorg Trading Corp., Excello, Odessa, 193 coils.
——, America, Hamburg, 64 coils.

CASEIN

A. Hurst & Co., Volendam, Rotterdam, 117 bags.

WOOD FLOUR

Trust Co. of New Jersey, Volendam, Rotterdam, 200 bags.
Innes Speiden & Co., Drottningholm, Gothenburg, 508 bags.

WOOD PULP

Irving Trust Co., Stuttgart, Bremen, 150 bls. wood pulp.
Amtorg Trading Corp., Cliffwood, Leningrad, quantity pulpwood.
Amtorg Trading Corp., Com'l Guide, Leningrad, quantity pulpwood.
Bulkley Dunton & Co., Pilot, ——, 983 bls. wood pulp.
Johaneson Wales & Sparre, Inc., Pilot, Ortviken,

(*Continued on page 58*)

Union Screen Plate Company

Fitchburg, Mass., U. S. A. Lennoxville, P. Q., Canada

UNION BRONZE

SCREEN PLATES FOR FLAT SCREENS

6 SLOTS—5 SLOTS—4½ SLOTS—4 SLOTS—PER INCH

Old Plates Reclosed and Re-cut to Accurate Gauge
Rolled Phosphor Bronze and Copper Plates for Rotary Screens

Sole Manufacturers of the Union Witham Screen Plate Vat and Fastener

TRIUNE

AND

MULTIPLE PLY DRYER FELTS

Serve every Felt Purpose in an efficient and satisfactory way.

ENGLISH or BAKER WOVEN

Made in three, four, five and six ply—60″ to 214″ wide.

FITCHBURG DUCK MILLS
FITCHBURG, MASS.

For 87 Years Makers of Fine Faced Felts For Papermakers

1864 **1931**

"EXCELSIOR" FELTS

for every grade of

PULP AND PAPER

We continue to maintain at the top the quality of Excelsior Felts, as we have done since we, as pioneers, made the first endless paper machine felts manufactured in America.

Seamless felts for fast running.
Satin Style felts for finish.
Special felts to meet every condition.
Send us your felt problems.

KNOX WOOLEN COMPANY
CAMDEN, MAINE

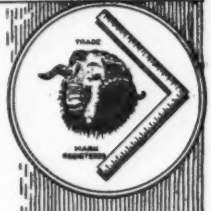
SOLD BY

BULKLEY, DUNTON & COMPANY

75-77 Duane St., N. Y., and direct

3 FEATURES of our "TOP FELTS for BOARD MACHINES"

A Trial Felt for Your Machines Will Prove These Facts.



THE WATERBURY FELT CO., SKANEATELES FALLS, N.Y.

Imports of Paper and Paper Stock

(Continued from page 56)

1175 bls. sulphite, 238 tons.
Johaneson Wales & Sparre, Inc., Pilot, Svartvik, 150 bls. chemical pulp, 30 tons.
Johaneson Wales & Sparre, Inc., Pilot, Soraker, 2000 bls. sulphate, 405 tons.
——, Pilot, Hernosand, 600 bls. sulphite, 100 tons.
Castle & Overton, Inc., Volendam, Rotterdam, 160 bls. wood pulp.
J. Anderson & Co., Bird City, Hernosand, 3900 bls. sulphite, 650 tons.
Price & Pierce, Ltd., Bird City, Hernosand, 2100 bls. sulphite, 350 tons.
Parsons & Whittemore, Inc., Bird City, Helsingfors, 300 bls. wood pulp, 50 tons.
Lagerloef Trading Co., Bird City, Helsingfors, 130 bls. sulphate, 26 tons.
Stora Kopparberg Corp., Bird City, Skutskar, 1150 bls. wood pulp, 233 tons.
Perkins Goodwin & Co., Bird City, Sundsvall, 3900 bls. sulphite.
Brown Bros. Harriman & Co., Yuri Maru, Hamburg, 176 bls. wood pulp, 26 tons.
Kidder Peabody Accep. Corp., Yuri Maru, Hamburg, 340 bls. wood pulp, 51 tons.
Bulkley Dunton & Co., East Indian, ——, 9000 bls. wood pulp, 1800 tons.
——,East Indian, Hernosand, 6150 bls. sulphite, 1025 tons; 300 bls. sulphate, 50 tons.
Johaneson Wales & Sparre, Inc., East Indian, Sundsvall, 750 bls. chemical pulp, 150 tons; 6175 bls. sulphite, 1210 tons.
Johaneson Wales & Sparre, Inc., East Indian, Obbola, 350 bls. sulphate, 50 tons.
Russell McCandless, Drottningholm, Gothenburg, 150 bls. unbleached sulphite; 150 bls. kraft pulp.
Perkins Goodwin & Co., Drottningholm, Gothenburg, 127 bls. sulphate.

BALTIMORE IMPORTS

WEEK ENDING AUGUST 8, 1931

M. W. Proyr, Vincent, Havre, 2 cs. writing paper.
Congoleum Nairn Co., Collarmer, St. Nazaire, 140 bls. rags.
S. Shapira & Son, Liberty, Dunkirk, 60 bls. rags.
American Express Co., Liberty, Havre, 4 cs. writing paper.
Russell McCandless, Sparreholm, Stockholm, 2250 bls. unbleached sulphite.

NORFOLK IMPORTS

WEEK ENDING AUGUST 8, 1931

Amtorg Trading Corp., Excello, Odessa, 67 bls. rags.

NEWPORT NEWS IMPORTS

WEEK ENDING AUGUST 8, 1931

Bulkley Dunton & Co., Pilot, ——, 5090 bls. wood pulp, 1018 tons.
Johaneson Wales & Sparre, Inc., Pilot, Svartvik, 300 bls. sulphite, 50 tons.
——, Pilot, Hernosand, 960 bls. sulphite, 160 tons; 3150 bls. sulphate, 525 tons.
Johaneson Wales & Sparre, Inc., Pilot, Obbola, 1400 bls. sulphate, 200 tons.
Price & Pierce, Ltd., Bord City, Stockholm, 321 bls. sulphite, 40 tons.
——, East Indian, Hernosand, 360 bls. sulphite, 60 tons; 3300 bls. sulphate, 550 tons.
Bulkley Dunton & Co., East Indian, ——, 3750 bls. wood pulp, 750 tons.

PHILADELPHIA IMPORTS

WEEK ENDING AUGUST 8, 1931

National Vulcanized Fibre Co., Vincent, Dunkirk, 166 bls. rags.
Katzenstein & Keene, Inc., Vincent, Dunkirk, 292 bls. rags.
National Waste Co., Vincent, Dunkirk, 41 bls. thread waste.
National Vulcanized Fibre Co., Vincent, Havre, 49 bls. rags.
V. Galaup, Vincent, Havre, 57 bls. rags.
J. A. Steer & Co., Vincent, Havre, 67 bls. rags.
Katzenstein & Keene, Inc., Vincent, Havre, 225 bls. rags.
Castle & Overton, Inc., Vincent, Havre, 130 bls. rags.
Bulkley Dunton & Co., Pilot, ——, 250 bls. wood pulp, 50 tons.
Pagel Horton & Co. Inc., Pilot, Ortviken, 750 bls. sulphite, 152 tons.
Parsons & Whittemore, Inc., Pilot, Ortviken, 122 rolls news print.
Johaneson Wales & Sparre, Inc., Pilot, Svartvik, 3000 bls. sulphate, 508 tons.
Johaneson Wales & Sparre, Inc., Pilot, Soraker, 1750 bls. sulphate, 355 tons.
——, Pilot, Hernosand, 600 bls. sulphite, 100 tons; 1500 bls. sulphate, 250 tons.
Leipheimer & Co., N. Maersk, Kobe, 20 bls. rags.
Keystone Wiper & Supply Co., N. Maersk, Kobe, 75 bls. rags.
H. W. T. Mali & Co., N. Maersk, Kobe, 150 bls. rags.
Cotton Products Co., N. Maersk, Kobe, 40 bls. rags.
Union Waste Co., N. Maersk, Kobe, 50 bls. rags.
J. M. Hagy Waste Works, N. Maersk, Kobe, 44 bls. rags.
American Over Ocean Corp., N. Maersk, Kobe, 50 bls. cotton waste.
Perkins Goodwin & Co., Bird City, Hernosand, 447 bls. wood pulp, 89 tons.
J. Anderson & Co., Bird City, Hernosand, 150 bls. sulphite, 25 tons.
Parsons & Whittemore, Inc., Bird City, Helsingfors, 300 bls. wood pulp, 50 tons.
Stora Kopparberg Corp., Bird City, Skutskar, 1750 bls. wood pulp, 355 tons.
Perkins Goodwin & Co., Bird City, Sundsvall, 500 bls. sulphate; 625 bls. sulphite.
Katzenstein & Keene, Inc., Collamer, St. Nazaire, 63 bls. rags.
H. G. Lichtenstein, Collamer, St. Nazaire, 190 bls. rags.
Castle & Overton, Inc., Collamer, St. Nazaire, 35 bls. rags.
H. G. Lichtenstein, Collamer, Bordeaux, 252 bls. rags.
D. I. Murphy, Collamer, Bordeaux, 29 bls. rags.
J. A. Steer & Co., Cabo Mayor, Marseilles, 126 bls. rags.
Amtorg Trading Corp., Excello, Odessa, 1096 bls. rags.
V. Galaup, Ala, Antwerp, 107 bls. bagging.
Katzenstein & Keene, Inc., Ala, Antwerp, 157 bls. rags.
W. J. Jones, Cabo Mayor, Genoa, 6 cs. paper.

PORTLAND IMPORTS

WEEK ENDING AUGUST 8, 1931

Price & Pierce, Ltd., Bird City, Hernosand, 2550 bls. sulphite, 425 tons.
Lagerloef Trading Co., Bird City, Helsingfors, 1825 bls. sulphite, 304 tons.
Stora Kopparberg Corp., Bird City, Skutskar, 3125 bls. wood pulp, 634 tons.
Kopparberg Hofors Sagverks Akt., Bird City, Norrsundet, 1000 bls. sulphate, 203 tons.

BOSTON IMPORTS

WEEK ENDING AUGUST 8, 1931

Bulkley Dunton & Co., Pilot, ——, 2375 bls. wood pulp, 475 tons.
Perkins Goodwin & Co., Pilot, Ortviken, 1125 bls. sulphite, 226 tons.
Perkins Goodwin & Co., Pilot, Obbola, 3500 bls. sulphate, 500 tons.
Chase National Bank, Pilot, Obbola, 5250 bls. sulphate, 750 tons.
Johaneson Wales & Sparre, Inc., Pilot, Svartvik, 125 bls. chemical pulp, 25 tons; 600 bls. sulphite, 101 tons.
Johaneson Wales & Sparre, Inc., Pilot, Soraker, 375 bls. sulphite, 75 tons.
——, Pilot, Hernosand, 2130 bls. wood pulp, 355 tons.
1st Natl Bank of Boston, Winona Co., Liverpool, 92 coils old rope.
——, Winona Co., Manchester, 34 bls. old rope.
T. D. Downing & Co., Winona Co., Manchester, 43 bls. paper stock.
——, Bird City, Hernosand, 1800 bls. sulphate, 300 tons.
J. Anderson & Co., Bird City, Hernosand, 1200 bls. sulphite, 200 tons.
Price & Pierce, Ltd., Bird City, Hernósand, 1200 bls. sulphite, 200 tons.
Stora Kopparberg Corp., Bird City, Skutskar, 397 bls. wood pulp, 80 tons.
Kopparberg & Hofors Sagverks Akt., Bird City, Norrsundet, 3500 bls. sulphate, 711 tons.
Perkins Goodwin & Co., Bird City, Sundsvall, 250 bls. sulphite.
G. M. Graves Co., Ala, Antwerp, 86 bls. rags.
Brown Bros. Harriman & Co., Ala, Antwerp, 66 coils old rope.
Irving Trust Co., Ala, Antwerp, 52 bls. bagging.
Forte Dupee Sawyer Co., Ala, Antwerp, 8 bls. rags.

Compensation Awards

[FROM OUR REGULAR CORRESPONDENT]

CARTHAGE, N. Y., August 3, 1931—A number of injured paper mill workers are benefitted by decisions recently handed down in Compensation Court. Lester Dugaw, an employe of the Norfolk plant of the St. Regis Paper Company, was awarded compensation for four weeks at $11.46 weekly for lost time as the result of a fractured toe received while working. John Vari was awarded $364.15 compensation for injuries received at the Norfolk plant of the St. Regis Co., the award being based on $13.23 for 27 weeks. An award of $8.47 per week on decreased earning capacity from June 19 to date was granted Louis Herne for injuries received while working for the Racquette River Paper Company and the case was closed. Oscar Valiquette, an employee of the Ticonderoga Pulp and Paper Company was awarded $105.54 for injuries. The case of George Sabad, an employee of the Norfolk mill of the St. Regis Paper Company, who has already received compensation for lost time, was continued for settlement.

Dry Gum Rosin Size by Kalbfleisch

Gum rosin size in dry form is now available from The Kalbfleisch Corporation. Much research, experimentation and checking were necessary to develop this product for the paper mill in this form, and Kalbfleisch has spent considerable time and money at it. It bids fair to be an interesting and successful newcomer among rosin sizes.

WOOD PULPS

All Grades

CHICAGO OFFICE:
1460 Conway Building,
111 West Washington St.

Acer, McLernon & Company Limited

CANADA CEMENT BUILDING
MONTREAL, P. Q.

KELLOGG *Masterweld*

DUCTILE — TOUGH

DIGESTERS

Boiler Drums ⁊ Headers ⁊ Receivers
Separators and Complete
Power Plant Piping

THE M. W. KELLOGG COMPANY
225 Broadway, New York City, and at Birmingham
Boston, Chicago, Los Angeles, Tulsa

All Kellogg Welded Products Are Insurable

The uses of Liquid Chlorine

are rapidly expanding, so we are improving our facilities, and are prepared to ship promptly in Tank Cars, Multi-Unit Tank Cars (1-ton containers), or Cylinders (150 lbs. or 100 lbs.) from either Philadelphia, Pa., Wyandotte, Mich., Menominee, Mich., or Tacoma, Wash.

Inquiries and general correspondence should be addressed to our Philadelphia Office

Pennsylvania Salt Mfg. Company
Incorporated 1850.
Widener Building, Philadelphia, Pa.

Representatives:
New York Pittsburgh Chicago St. Louis
Works:
Natrona, Pa. Wyandotte, Mich.
Philadelphia, Pa. Menominee, Mich.
Tacoma, Wash.

THE CLARK-AIKEN CO.

Successors to
H. C. Clark & Son Machine Co.

PAPER MILL MACHINERY
LEE, MASS.

Revolving Paper Cutters—Rag Cutters—Cylinder Paper Machines—Washing and Beating Engines—Chilled Iron and Paper Calenders—Fan and Stuff Pumps—Engine Roll Bars and Bed Plates—
Cylinder Molds—Marshall Drives—Slitters and Rewinders—Reels—Dryers with Improved Packing Boxes—Wet Machines—Gun Metal and Rubber Rolls—Rolls Reground.

The HARRINGTON & KING PERFORATING CO.
5652 Fillmore St.
Chicago, Ill.
New York Office
114 Liberty St.

Screens of All Metals

PERFORATED METALS

For use in Pulp and Paper Mills

LAND O'LAKES CASEIN

LAND O'LAKES

High quality Casein made under strict laboratory control. Excellent solubility. Satisfactory viscosity. Write for sample and quotations.

LAND O' LAKES CREAMERIES, INC., MINNEAPOLIS, MINN.
New York City - Chicago - Boston - Philadelphia - Pittsburgh - Syracuse

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, August 12, 1931.

Conditions in the local paper market are fairly satisfactory considering the general business depression and the usual mid-summer lull. Although demand for the various standard grades of paper is light, inquiries are fairly numerous and the outlook for the closing months of the year is promising. Prices are generally steady and unchanged.

Production of news print is being maintained in sufficient volume to take care of current requirements and accumulations are not excessive. Demand from the publishers is expected to expand shortly due to the normal increase in advertising pages which takes place in the Autumn and winter months. No further changes have been reported in the price situation.

There is a better feeling in the paper board market and preparations are being made to meet the demand anticipated after the Labor Day holidays. Prices remain unchanged. The fine paper market continues moderately active. Tissues are going forward in seasonal volume. The coarse paper market is irregular although summer specialties are in excellent request.

Mechanical Pulp

While the ground wood market is quiet, the industry is considered in a sound statistical position. Both at home and abroad the output has been somewhat curtailed and offerings are not much in excess of requirements. There are a fair number of inquiries around for future account. Prices are generally holding to previously quoted levels, without difficulty.

Chemical Pulp

Steadiness prevails in the chemical pulp market. The bright particular feature of the weeks trading was the continued firmness of kraft pulp. No. 1 imported kraft pulp is quoted at from $1.50 to $1.70 and No. 2 kraft at from $1.40 to $1.50; on dock, Atlantic ports. Domestic kraft pulp is selling at from $1.60 to $2.75, f.o.b. pulp mill.

Old Rope and Bagging

Further weakness developed in the old rope market. Prices are easier. Imported manila rope is now quoted at from $1.75 to $1.85 and domestic manila rope is selling at from $1.90 to $2.00. Small mixed rope rules dull. The bagging market is rather spotty. Scrap bagging is moderately active, however, while gunny bagging is quiet.

Rags

Trading in the domestic rag market is restricted at present. Little interest is being evinced by the paper mills in cotton cuttings. Roofing stock, however, is fairly active. Mixed rags are going forward in moderate volume. The price situation is unsatisfactory. Dullness reigns in the imported rag market and prices are slightly weaker.

Waste Paper

Some improvement was noticed in the paper stock market and the board mills, in particular, are showing more interest in the lower grades. No. 1 white news is firmer and is now quoted at from $1.60 to $1.65. No. 1 mixed paper is also showing strength and is offered at from $.25 to $.30. Old kraft machine compressed bales are in excellent request.

Twine

Most of the business transacted in the twine market was along routine lines. Supplies are moving into consumption in normal volume for the time of year. Local dealers are anticipating a greatly increased demand shortly, which should continue until the end of the year, at least. Prices are generally holding to previously quoted levels.

Kieffer Paper Mills Get Refund

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 12, 1931.—The Bureau of Internal Revenue, Treasury Department, has announced a refund to the Kieffer Paper Mills, of Ewing, Ind., of an overassessmen of income and profits taxes for the year 1920 amounting to $48,307.61.

David Burnet, Commissioner, in announcing the refund states that "the amount of $47,829.32 of the overassessment is due to a redetermination of the tax liability under the retroactive provisions of section 704 (a), Revenue Act of 1928, since the taxpayer filed its return as a trust and was considered to be taxable as a trust and not as a corporation under the regulations in force at the time the return was made.

"The balance of the overassessment in the amount of $478.29 represents the remission of the interest assessed on the prior determinated deficiency in tax since the present overassessment causes the elimination of the interest."

Receivers for Wheelwright Paper Co.

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., August 10, 1931—Judge Henry T. Lummus in the equity session of the Superior Court today, after a hearing, said he would appoint receivers for the George W. Wheelwright Company, of North Leominster and Hardwick. After stating that he did not think names proposed for any receivership should be "bandied about" in public, he conferred with counsel privately in his lobby, and then took under advisement the question of whom he would appoint. There was no opposition to the receivership. Former Governor David I. Walsh appeared as counsel for the corporation. Counsel for the petitioner, the Train Smith Company, a paper stock firm, of Boston, said it was thought that if the concern were liquidated at once creditors might not be paid in full, but that there could be full payment if the concern were operated for a time.

Arthur D. Little, Inc.

Chemists and Engineers to the Pulp and Paper Industry for over Forty Years

Laboratories and Experimental Mill

30 CHARLES RIVER ROAD, CAMBRIDGE, MASS.

Hardy S. Ferguson & Co.

Consulting Engineers

200 Fifth Avenue, New York City

Hardy S. Ferguson .....Member A.S.C.E., A.S.M.E., E.I.C.
Moses H. Teaze.....Member A.S.M.E., E.I.C.
J. Wallace Tower.....Member A.S.C.E., A.S.M.E.

Consultation, reports, valuations, and complete designs and engineering supervision for the construction and equipment of

Pulp and Paper Mills and other Industrial Plants.
Steam and Hydro-electric Power Plants.
Dams and other Hydraulic Structures.

GEORGE F. HARDY

Consulting Engineer

305-309 Broadway, New York City, N. Y.

Member—Am. Soc. C.E.—Am. Soc. M.E.—Eng. Inst. Can.

Consultation	Paper and Pulp Mills
Reports	Hydro-Electric and
Valuations	Steam Power Plants
Estimates	Plans and Specifications

V. D. SIMONS

INDUSTRIAL ENGINEER

Pulp and Paper Mills, Hydro-Electric and Steam Power Plants, Electrification Paper Mill Properties.

435 No. Michigan Ave.
CHICAGO, ILL.

20 plants to serve You

PAPER MAKERS CHEMICAL CORP.
Kalamazoo, Michigan

H. S. TAYLOR

Consulting Engineer

Member Am. Soc. C. E.—Member Am. Soc. M. E.
Member Eng. Inst., Can.

PULP, PAPER, AND FIBRE MILLS
HYDRO - ELECTRIC AND STEAM
POWER PLANTS

PLANS-SPECIFICATIONS-EVALUATIONS
REPORTS - CONSULTATIONS

Jefferson St. Arcade, Dayton, O.
Guarantee Bldg., Montreal, P. Q.

Maximum Structural Strength with . . Minimum Weight

Send for Bulletin 30-2

FOR AIR-WATER-OIL AND GAS

In sizes 6" to 24" in diameter and lengths to 40 feet.

NAYLOR PIPE COMPANY
CHICAGO, ILL.

Sales Offices: New York - Philadelphia - Tulsa - Houston - Ft. Worth

WATER SOFTENING ZEOLITE

BASEX

for

Replacement in All Makes

of

ZEOLITE WATER SOFTENERS

Send for Leaflet A and Sample

INVERSAND COMPANY
CLAYTON, NEW JERSEY

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, August 12, 1931.

BLANC FIXE.—The blanc fixe market was rather quiet during the past week. The contract movement was fair. The pulp is quoted at from $42.50 to $45 per ton; while the powder is still selling at from 3¾ cents to 4½ cents per pound, in barrels, at works.

BLEACHING POWDER.—Steadiness prevails in the bleaching powder market. Contract shipments are moving with regularity. Prices are holding to schedule, without difficulty. Bleaching powder is quoted at from $2 to $2.35 per 100 pounds, in drums, at works.

CASEIN.—The casein market continues dull. Domestic standard ground is quoted at 6 cents and finely ground at 7½ cents per pound. Argentine standard ground is selling at 8½ cents and finely ground at 9½ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Conditions in the caustic soda market are fairly satisfactory. Prices remain unchanged. Solid caustic soda is quoted at from $2.50 to $2.55; while the flake and the ground are selling at from $2.90 to $2.95 per 100 pounds, in large drums, at works.

CHINA CLAY—The position of the china clay market is practically unchanged. The contract movement is seasonal. Imported china clay is still quoted at from $13 to $21 per ton; while domestic paper making clay is selling at from $7 to $11 per ton, at mine.

CHLORINE.—The chlorine market is displaying a steady trend. While spot demand is light, contract shipments are moving in good volume. Prices remain unchanged. Chlorine is quoted at $1.75 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—Weakness developed in the rosin market. The grades of gum rosin used in the paper mills are now quoted at from $4.10 to $4.25 per 280 pounds, in barrels, at works. Wood resin is selling at $3.70 per 280 pounds, in barrels, on dock, car lot quantities.

SALT CAKE.—Demand for salt cake was somewhat restricted during the past week. Salt cake is still quoted at from $16 to $17 and chrome salt cake at from $14 to $15 per ton, in bulk, at works. Imported salt cake is selling at from $15 to $15.50 per ton, ship side.

SODA ASH.—The soda ash market is exhibiting a fairly steady trend, considering the prevailing business depression. Prices are steady. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1; in bags, $1.15; and in barrels, $1.38.

STARCH.—Some improvement was noticed in the starch market, influenced to some extent by the stronger position of grain. Prices are holding to schedule. Special paper making starch is selling at $2.67, in bags; and at $2.94 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—There were no radical changes in the sulphate of alumina market. Demand was fairly persistent. Commercial grades are still quoted at from $1.25 to $1.40; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market was fairly active. Sulphur is quoted at $18 per long ton on orders of 1,000 tons, or over, on yearly contracts; and at $20 on any smaller quantity over that period. On spot and near by car loads, the quotation is $21 per ton.

TALC.—Most of the business transacted in the talc market during the past week was along routine lines. Prices remain unchanged. Domestic talc is quoted at from $16 to $18 per ton, in bulk; while imported talc is selling at from $18 to $22 per ton, ship side.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	11.00	@	38.00
Bonds	6.75	@	53.25
Writings—			
Extra Superfine	14.00	@	32.00
Superfine	14.00	@	32.00
Tub sized	10.00	@	15.00
Engine sized	6.75	@	11.00
Book, Cased—			
S. & S. C.	5.25	@	—
M. F.	5.00	@	—
Coated and Enamel	6.75	@	10.25
Lithograph	7.25	@	11.75
Tissues—Per Ream—			
White No. 1	.65	@	.70
Anti-Tarnish M. G. only	.65	@	.70
Colored	.70	@	.90
White No. 2	.55	@	.60
Kraft	.65	@	.70
Manila	.55	@	.60
Manila—			
No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00
Butchers	3.37½	@	—
Fibre Papers—			
No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75
Common Bogus	1.50	@	3.00
Screenings	2.00	@	3.00
Card Middles	4.00	@	5.00
Glassine—			
Bleached, basis 25 lbs., No. 1	.09¼	@	—
No. 2	.11¼	@	—
Bleached, basis 20 lbs.	.11¼	@	—
(Delivered New York)			
News, per ton—			
Rolls, contract	57.00	@	—
Rolls, spot	57.00	@	—
Sheets	62.00	@	—
Side Runs	42.00	@	46.00
Kraft—			
No. 1 Domestic	4.50	@	5.75
No. 2 Domestic	4.00	@	4.50
Southern	3.45	@	4.25
Imported	6.00	@	7.00
Boards—per ton—			
News	26.00	@	27.50
Straw	34.50	@	45.00
Chip	26.00	@	27.50
Binders' Boards	65.00	@	70.00
Standard 85 Test Liner	32.50	@	35.00
Sgl. Mla. Ll. Chip	37.50	@	42.50
(F. o. b. Mill)			
Wood Pulp Boards	70.00	@	80.00

Mechanical Pulp

(On Dock)

No. 1 Imported—			
Moist	24.00	@	28.00
Dry	26.00	@	28.00
(F. o. b. Mill)			
No. 1 Domestic	25.00	@	30.00

Chemical Pulp

(On Dock, Atlantic Ports)

Sulphite (Imported)—			
Bleached	2.50	@	3.50
Easy Bleaching	2.15	@	2.35
No. 1 strong unbleached	1.90	@	2.25
Mitscherlich unbleached	2.00	@	2.25
No. 2 strong unbleached	1.75	@	1.90
No. 1 Kraft	1.50	@	1.70
No. 2 Kraft	1.40	@	1.50
Sulphate—			
Bleached	2.75	@	3.25
(F. o. b. Pulp Mill)			
Sulphite (Domestic)—			
Bleached	2.25	@	4.75
Easy Bleaching	2.50	@	2.75
News	1.80	@	2.50
Mitscherlich	2.40	@	3.00
Kraft (Domestic)	1.60	@	2.75
(Delivered Paper Mills)			
Soda Bleached	3.00	@	—

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.50	@	7.00
New White, No. 2	5.50	@	6.00
Silesias No. 1	5.25	@	5.50
New Unbleached	7.00	@	7.50
New Blue Prints	4.00	@	4.50
New Soft Blacks	3.50	@	4.00
Blue Overall	5.00	@	5.25
Fancy	3.00	@	3.50
Washables	2.75	@	3.00
Mixed Khaki Cuttings	3.50	@	4.00
Pink Corset Cuttings	5.00	@	5.50
O. D. Khaki Cuttings	4.50	@	4.75
Men's Corduroy	3.00	@	3.50
New Mixed Blacks	3.00	@	3.25

Old Rags

White, No. 1—			
Repacked	5.25	@	5.75
Miscellaneous	4.25	@	4.75
White, No. 2—			
Repacked	3.00	@	3.50
Miscellaneous	2.30	@	2.50
St. Soiled, White	1.50	@	1.75
Thirds and Blues—			
Repacked	2.25	@	2.50
Miscellaneous	1.65	@	1.85
Black Stockings	3.25	@	3.75
Roofing Rags—			
Cloth Strippings	1.25	@	1.30
No. 1	1.25	@	1.30
No. 2	.90	@	1.00
No. 3	.70	@	.80
No. 4	.65	@	.70
No. 5A	.50	@	.60

Foreign Rags

New Rags

New Dark Cuttings	2.00	@	2.15
New Mixed Cuttings	2.10	@	2.40
New Light Silesias	5.00	@	5.38
Light Flannelettes	5.00	@	5.25
Unbleached Cuttings	6.50	@	6.75
New White Cuttings	6.00	@	6.25
New Light Oxfords	5.00	@	5.50
New Light Prints	3.10	@	3.25

Old Rags

No. 1 White Linens	6.25	@	6.50
No. 2 White Linens	5.25	@	5.50
No. 3 White Linens	3.75	@	4.25
No. 4 White Linens	2.25	@	2.75
No. 1 White Cotton	4.50	@	5.00
No. 2 White Cotton	3.50	@	4.25
No. 3 White Cotton	2.50	@	3.25
No. 4 White Cotton	1.50	@	1.75
Extra Light Prints	1.90	@	2.10
Ord. Light Prints	1.75	@	1.90
Med. Light Prints	1.40	@	1.55
Dutch Blue Cottons	1.50	@	1.60
French Blue Linens	2.25	@	2.40
German Blue Linens	2.00	@	2.10
German Blue Cottons	1.35	@	1.40
Checks and Blues	1.40	@	1.45
Lindsay Garments	.90	@	1.00
Dark Cottons	.70	@	.75
Old Shopperies	.65	@	.70
New Shopperies	.60	@	.65
French Blues	1.40	@	1.50

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	1.55	@	1.65
Domestic	1.65	@	1.80
Wool Tares, light	1.15	@	1.20
Wool Tares, heavy	1.15	@	1.20
Bright Bagging	1.10	@	1.15
Small Mixed Rope	.90	@	1.00
Manila Rope—			
Foreign	1.75	@	1.85
Domestic	1.90	@	2.00
New Burlap Cut	1.70	@	1.80
Hessian Jute Threads—			
Foreign	2.60	@	2.75
Domestic	2.80	@	3.00

Old Waste Papers

(F. o. b. New York)

Shavings—			
Hard, white, No. 1	2.65	@	2.85
Hard, white, No. 2	2.10	@	2.20
Soft, white, No. 1	2.10	@	2.20
White envelope cuttings	2.35	@	2.50
Flat Stock—			
Stitchless	.70	@	.80
Overissue Mag.	.70	@	.80
Solid Flat Book	.60	@	.70
Crumpled No. 1	.48	@	.53
Solid Book Ledger	1.75	@	1.85
Ledger Stock	.65	@	.75
New B. B. Chips	.20	@	.30
Manilas—			
New Env. Cut	1.75	@	1.85
New Cuttings	1.40	@	1.50
Extra No. 1 old	1.10	@	1.25
Print	.45	@	.50
Bogus Wrapper	.45	@	.50
Container	.30	@	.35
Old Kraft Machine—Compressed bales	1.20	@	1.30
News—			
No. 1 White News	1.60	@	1.65
Strictly Overissue	.35	@	.45
Strictly Folded	.25	@	.30
No. 1 Mixed Paper	.25	@	.30
Common Paper			Nominal

WOOD PULP
AGENTS

PRICE & PIERCE, Ltd.,

60 EAST 42nd ST.
NEW YORK

Do a job better
or do it for less

PQ

SILICATES OF SODA

Thirty-three grades — powdered, solid and liquids — are made available by Quartz Quality.
How can they serve you?

1831—Beginning Another Century—1931

PHILADELPHIA QUARTZ CO.
General Offices and Laboratory
121 S. THIRD ST., PHILADELPHIA
Chicago Office: 205 W. WACKER DRIVE
Eight Plants *Distributors in 55 cities*

EDGAR · CLAYS

AMERICAN MADE
FOR
AMERICAN TRADE

600 TONS DAILY
CAPACITY

H. T. BRAND
COATING CLAY
HIGH GRADE FILLER

KLONDYKE BRAND
FILLERS

Technical service available for coating and loading without charge. Write for samples.

EDGAR BROS. CO.
50 CHURCH ST. NEW YORK

Twines

(F. o. b. Mill)

Cotton—			
B. C., 18 basis	.30	@	.32
No. 1	.20	@	.22
No. 2	.19	@	.20
No. 3	.17	@	.18
A. Italian, 18 basis	.36	@	.37
Finished Jute—			
Dark, 18 basis	.18	@	.20
Light, 18 basis	.20	@	.22
Jute Wrapping, 3-6 Ply—			
No. 1	.13	@	—
No. 2	.11	@	—
Tube Rope—			
4-ply and larger	.09	@	—
Fine Tube Rope—			
4-ply	.11	@	—
3-ply	.12	@	—
2-ply	.13	@	—
Paper Makers Twine Balls	.07	@	—
Box Twine, 2-3 ply	.07	@	.08
Jute Rope	.09	@	.10
Amer. Hemp, 6	.27	@	.29
Java Sisal—			
No. 1 Basis	.10	@	—
No. 2 Basis	.09	@	—
New Zealand Sisal	.10	@	—
Sisal Lath Yarn—			
No. 1	.12	@	.14
No. 2	.10	@	.12
Manila Twine	.21	@	.22

CHICAGO

Paper

(F. o. b. Mill)

Rag Bond	.30	@	.53¼
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.06¼	@	.11
Superfine Writing	.18	@	.24
No. 1 Fine Writing	.14	@	.18
No. 2 Fine Writing	.12	@	.14
No. 3 Fine Writing	.08½	@	.12
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¼	@	.07¼
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
No. 1 Manila	.04¼	@	.05¾
No. 1 Fibre	.04¼	@	.05¾
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.04	@	.04½
No. 1 Kraft	5.00	@	5.50
Southern Kraft	3.75	@	4.00
No. 2 Kraft	3.75	@	4.00
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue	.07	@	.07¼
White Tissue	.07¼	@	.07½

(Delivered Central Territory)

News, per ton—			
Rolls, contract	57.00	@	—
Sheets	62.00	@	—
Boards, per ton—			
Plain Chip	30.00	@	35.00
Solid News	32.50	@	37.50
Manila Lined Chip	40.00	@	45.00
Container Lined—			
85 Test	50.00	@	55.00
100 Test	55.00	@	60.00

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 Hard White	2.35	@	2.40
White Env. Cuttings	—	@	—
No. 1 Soft Shavings	2.10	@	2.15
Ledger & Writings	.70	@	.75
Solid Books	.75	@	.80
Blanks	1.60	@	1.65
Krafts	1.25	@	1.35
New Kraft Cuts	1.35	@	1.45
Manila Env. Cuts	1.50	@	1.55
Ex. No. 1 Manila	1.25	@	1.30
Print Manila	.40	@	.45
Overissue News	.40	@	.45
Old Newspapers—			
No. 1	.35	@	.40
No. 2	.30	@	.35
Mixed Papers—			
No. 1	.28	@	.30
No. 2	.20	@	.25
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper

(F. o. b. Mill)

Bonds	.05	@	.40
Ledgers	.07	@	.40
Writings—			
Superfine	.12	@	.18
Extra fine	.16	@	.22
Fine	.15	@	.26
Fine, No. 2	.12	@	.25
Fine, No. 3	.07	@	.20
Book, M. F.	.04¼	@	.07
Book, S. S. & C.	.05	@	.07½
Book, Coated	.07	@	.16
Coated Lithograph	.06	@	.11
Label	.07	@	.11
No. 1 Jute Manila	.07	@	.09
Manila Sul., No. 1	.03¼	@	.05½
Manila No. 2	.03	@	.04
No. 1 Kraft	.05¼	@	.06
No. 2 Kraft	.03½	@	.04¼
Southern Kraft No. 1	—	@	.04
Southern Kraft No. 2	—	@	.03¼
Common Bogus	.03	@	.04

(Delivered Philadelphia)

News Print Rolls	58.00	@	62.00
Straw Board	50.00	@	—
News Board	29.00	@	30.00
Chip Board	25.00	@	27.50
Wood Pulp Board	85.00	@	95.00
Binder Boards—			
No. 1, per ton	75.00	@	—
No. 2, per ton	66.00	@	—
Carload lots	62.00	@	67.00
Tarred Felts—			
Regular	55.50	@	57.00
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.06	@	.07
New White, No. 2.	.05½	@	.06
Light Silesias	.05	@	.05½
Silesias, No. 1	.06	@	.08
Black Silesias, soft.	.05	@	—
New Unbleached	.06½	@	.07
Washable, No. 1	.03	@	.03½
Blue Overall	.05	@	.05½
Cottons—According to grades—			
Washable, No. 2	.02	@	.02½
New Blue	.02	@	.02½
Fancy	.03½	@	—
New Black Soft	.03	@	.03½
New Light Seconds	.01¾	@	.02
New Dark Seconds	1.85	@	2.00
Khaki Cuttings—			
No. 1 O. D.	.04½	@	.05
No. 2 Mixed	.03½	@	.04
Corduroy	.02½	@	.03
New Canvas	.06½	@	.07
New Black Mixed	.03	@	.03½

Domestic Rags (Old)

White No. 1—			
Repacked	3.50	@	4.00
Miscellaneous	2.50	@	3.00
M. G.	4.50	@	—
Thirds and Blues—			
Miscellaneous	1.25	@	1.50
Repacked	1.75	@	2.00
Black Stockings (Export)	3.80	@	4.00
Roofing Stock—			
Foreign No. 1	1.15	@	1.25
Repacked	.80	@	.90

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.50	@	1.60
Domestic	1.75	@	—
Manila Rope	2.50	@	2.75
Sisal Rope	1.25	@	1.50
Mixed Rope	1.10	@	1.25
Scrap Burlaps—			
No. 1	1.50	@	1.60
No. 2	1.10	@	1.20
Wool Tares, heavy	3.00	@	—
Mixed Strings	1.15	@	1.25
No. 1 New Light Burlap	2.50	@	2.75
New Burlap Cuttings	2.00	@	2.25

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.30	@	2.35
No. 2 Hard White	2.00	@	2.05
No. 1 Soft White	1.75	@	1.85
No. 2 Soft White	1.30	@	1.45
No. 1 Mixed	.75	@	.80
No. 2 Mixed	.50	@	.55
Solid Ledger Stock	1.25	@	1.30
Writing Paper	.70	@	.80
No. 1 Books, heavy	.75	@	.80
No. 2 Books, light	Normal		
No. 1 New Manila	1.60	@	1.75
No. 1 Old Manila	1.25	@	1.30
Print Manila	.40	@	.50
Container Manila	.40	@	.45
Old Kraft	.90	@	1.05
Common Paper	.20	@	.25
No. 1 Mixed Paper	.25	@	.30
Straw Board, Chip	.35	@	.40
Binders Board, Chip	.35	@	.45
Corrugated Board	.40	@	.45
Overissue News	.35	@	.40
Old Newspaper	.25	@	.30

BOSTON

Paper

(F. o. b. Mill)

Ledgers—			
Sulphite	.07½	@	.12½
Rag Content	.15	@	.30
All Rag	.38	@	.52½
Bonds—			
Sulphite	.06½	@	.11½
Rag content	.15	@	.30
All rag	.36½	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04½	@	.05½
No. 2 Kraft	.03¾	@	.04½

(F. o. b. Boston)

Southern Kraft	.03¾	@	.04

(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.)

Common Bogus	.02	@	.02¾

(Delivered New England points)

News Print, rolls	—	@	56.50
Straw Board, rolls	.009	@	52.50
Straw Board in Sheets, basis 35s to 70s	—	@	50.00
Filled News Board	27.50	@	30.00
Chip Board	27.50	@	—
Chip Board (Creasing)	27.50	@	30.00
Single Manila Lined Chip	40.00	@	45.00
Single White, Patent Coated News Board—			
Binder	52.50	@	60.00
Wood Pulp Board	70.00	@	75.00
Binder Boards	67.50	@	75.00

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	3.25	@	3.75
No. 2 Hard White	2.50	@	2.60
No. 1 Soft White	2.25	@	2.40
No. 2 Mixed	.60	@	.65
No. 1 Mixed	.90	@	1.00
Solid Ledger Books	1.75	@	2.00
Overissue Ledger Stock	1.35	@	1.60
Mixed Ledgers	1.15	@	1.30
No. 1 Books, heavy	.75	@	.90
No. 1 Books, light	—	@	.45
Crumpled Stitchless Book Stock	1.00	@	1.25
Manila Env. Cuttings	1.85	@	2.00
No. 1 Old Manila	—	@	1.00
White Blank News	1.50	@	1.60
Kraft No. 1	—	@	1.25
Manila	.80	@	.90
No. 1 Mixed Paper	.16	@	.20
Print Manila	.35	@	.40
Overissue News	—	@	.40
Old Newspapers	.25	@	.30
Box Board, Chip	.16	@	.20
Corrugated Boxes	.35	@	.45

Bagging

(F. o. b. Boston)

Gunny, No. 1—			
Foreign	—	@	1.80
Domestic	1.50	@	1.60
Manila Rope—			
Foreign	—	@	1.75
Domestic	—	@	2.00
Transmission Rope	1.40	@	1.50
Mixed String	.50	@	.55
Jute Rope	1.00	@	1.15
Jute Carpet Threads	.75	@	.90
Bleachery Burlap	2.50	@	2.75
No. 1 Scrap Burlap	1.10	@	1.25
Scrap Sisal	1.35	@	1.45
Scrap Sisal for shredding	1.50	@	1.60
Wool Tares, heavy	1.25	@	1.30
New Burlap Cutting	1.50	@	1.25
Australian Pouches	2.00	@	2.25
Heavy Baling Bagging	1.50	@	1.60
Paper Mill Bagging	.90	@	1.05
Bagging No. 2	.50	@	—
No. 1 Burlap	—	@	3.50

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New White No. 1.	.06½	@	.07
New White No. 2.	—	@	.06
Silesias No. 1	.06	@	.06½
New Black Silesias	.02½	@	.02¾
New Unbleached	—	@	.08
Fancy	.04	@	.04½
Washable	.04	@	.04½
Cottons—According to grades—			
Blue Overalls	.05	@	.06
New Black, soft	.04	@	.04½
Khaki Cuttings	.04	@	.04½
O. D. Khaki	.04½	@	.05
Corduroy	.03	@	.03½
New Canvas	.08	@	.08½

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	4.75	@	5.25
Miscellaneous	—	@	4.00
White No. 2—			
Repacked	.04½	@	.05
Miscellaneous	.03½	@	.04
Twos and Blues	2.50	@	2.75
Thirds and Blues—			
Repacked	1.60	@	1.80
Miscellaneous	1.00	@	1.20
Black Stockings	3.25	@	3.50
Roofing Stock—			
No. 1	—	@	.63
No. 2	—	@	.58
No. 3	—	@	.53

Foreign Rags

(F. o. b. Boston)

Dark Cottons	—	@	.70
New No. 1 White Shirt Cuttings	6.50	@	6.75
Dutch Blues	—	@	1.80
New Checks & Blues	4.00	@	4.50
Old Fustians	1.55	@	1.65
Old Linsey Garments	.80	@	.90

TORONTO

Paper

(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.10¾	@	—
No. 2 Sulphite	08½	@	—
No. 1 Colored	.11¾	@	—
No. 2 Colored	.09	@	.10½
Ledgers (sulphite)	—	@	—
Ledgers, No. 1	.36	@	—
Ledgers, No. 2	.27	@	—
Writing	.09½	@	.10
Book—			
No. 1 M. F. (carloads)	6.65	@	—
No. 3 M. F. (carloads)	6.20	@	—
No. 1 S. C. (carloads)	7.15	@	—
No. 3 S. C. (carloads)	6.65	@	—
No. 4 S. C. (carloads)	5.70	@	—
No. 1 Coated and Litho	12.50	@	—
No. 2 Coated and Litho	11.50	@	—
No. 3 Coated and Litho	10.00	@	11.50
Coated tinted	14.00	@	—
Wrapping—			
Rag Brown	4.95	@	—
White Wrap	5.25	@	—
"B" Manila	5.00	@	—
No. 1 Manila	5.40	@	—
Fiber	5.40	@	—
Kraft, M. F.	5.90	@	—
Kraft No. 2	5.40	@	—

(Delivered Toronto)

News, per ton—			
Rolls (contract)	56.50	@	57.00
Sheets	61.50	@	—

Pulp

(F. o. b. Mill)

Ground Wood	30.00	@	32.00
Sulphite easy bleaching	50.00	@	—
Sulphite, news grade	44.00	@	—
Sulphite, bleached	62.50	@	75.00
Sulphate	60.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.80	@	—
Soft White	2.60	@	—
White Blk. News	1.50	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	1.10	@	—
Light and Crumpled Book Stock	1.20	@	—
Ledgers and Writings	—	@	—
Manilas—			
New Manila Cut	1.50	@	—
Printed Manilas	.80	@	—
Kraft	1.90	@	—
News and Scrap—			
Strictly Overissue	.70	@	—
Strictly Folded	.70	@	—
No. 1 Mixed Paper	.60	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.09½	@	.10
Fancy Shirt Cuttings	.06	@	.06¼

To
THE
PAPER MILL
SUPERINTENDENT

It is sound economy to generalize in G D C Colors.

Consult our representative—he can offer suggestions.

There is a G D C color for every specialized need.

Current colors are carried in stock at all our offices.

GDC

GENERAL
DYESTUFF
CORPORATION

230 Fifth Ave.
New York,
N. Y.

PAPER TRADE JOURNAL
ESTABLISHED 1872

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

SIXTIETH YEAR

Published Every Thursday by the
LOCKWOOD TRADE JOURNAL CO., Inc.

GEO. S. MACDONALD, President: J. BANNINGA, Sec.-Treas.
Published at 34 No. Crystal St., East Stroudsburg, Pa.
Executive and Editorial Offices: 10 East 39th Street, New York
Chicago Office: 123 West Madison St.

TABLE OF CONTENTS

Copyright, 1931, by the Lockwood Trade Journal Co., Inc.

Paper Makers Oppose Freight Rate Increase 15
Gradual Increase Since 1916 15
Canada Power & Paper Reorganization 16
Personnel of the Directorate 16
Frank L. Kemp Dead 17
The Position of Security Holders 17
Consolidated Water Power Dam Improvements .. 20
Dr. Zon Completes 30 Years Service 20
A. N. Strange Dead 20
Paper Demand Improves in Philadelphia 22
Penn Paper & Stock Co. Rebuilding 22
Plans for Franklin Memorial Paper Exhibit 22
New Jessup & Moore Line 24
Paper Manufacturers Co. New Plant Completed .. 24
Indianapolis Paper Demand Draggy 24
A Veteran Roll Grinding Expert 26
New Ludlow Multi-Valve 26
May Buy Storey Parchment Co. 26
Construction News 29
Boston Paper Business Normal 30
Interest in Brotherhood Election 30
To Take Over Fonda Container Co. 30
New York Trade Jottings 32
Editorial **34**
Paper and Pulp Industry in June 35
E. H. Mayo Leaves Southern Kraft 35
Germany Leads in Reforestation 35
Technical Section
Effect of Air Treatment on Jack Pine Chips to Overcome Pitch Trouble 37
Burning Waste Wood in the Pulp and Paper Industry 40
Current Paper Trade Literature 43
Fibrous Raw Materials Report 47
Power Plant Section **49**
New Press Roll Doctor 54
Imports of Paper and Paper Stock 56
New York Market Review **60**
Miscellaneous Markets **62**
Market Quotations **62**

THE PAPER TRADE JOURNAL is indexed in Industrial Arts Index

Want and For Sale Advertisements, 66-67

THE PULSE OF A GREAT INDUSTRY

A glimpse into one of the largest cell rooms in the world; and the product is EBG Liquid Chlorine.

High manufacturing standards; complete service; unvarying worth of product . . . these are the intangible qualities which underly the making of EBG Liquid Chlorine.

And they are tangibly evidenced by such massive properties as this cell room in the plant at Niagara Falls. Row upon row of cells, for making EBG Liquid Chlorine . . . covering an immense space!

ELECTRO BLEACHING GAS CO.
Pioneer Manufacturers of Liquid Chlorine
Main Offices: 9 E. 41st St., New York, N. Y. Plant: Niagara Falls, N. Y.

Liquid Chlorine